



US006144726A

United States Patent [19]

Cross

[11] **Patent Number:** 6,144,726
 [45] **Date of Patent:** Nov. 7, 2000

- [54] **TELECOMMUNICATIONS ACCESS COST MANAGEMENT SYSTEM**
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- [73] Assignee: **CSG Systems, Inc.**, Englewood, Colo.
- [21] Appl. No.: **09/096,786**
- [22] Filed: **Jun. 12, 1998**
- [51] Int. Cl.⁷ **H04M 15/00**
- [52] U.S. Cl. **379/112; 379/114; 379/121**
- [58] Field of Search **379/111, 112, 379/114, 115, 116, 118, 119, 120, 127, 144; 455/405, 406**

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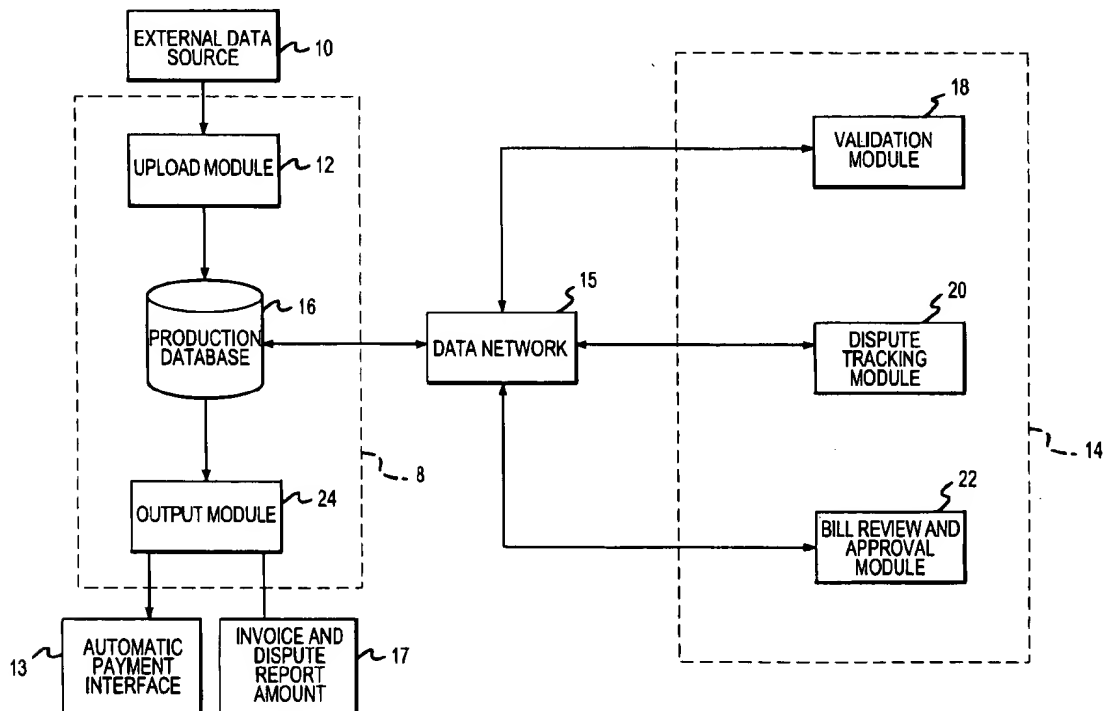
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Attorney, Agent, or Firm—Marsh Fischmann & Breyfogle LLP

[57] ABSTRACT

A Telecom Access Billing System provides the capability for a communication carrier service provider to substantially automate the payment to other communication carrier service providers for the use of their services and equipment. Billed charges are received in a variety of forms from the communication carrier service providers which are providing the services. A processor uploads the information, checks its integrity, and converts it to a format in which it can be further processed. Once the information has been uploaded and converted, a validation process is performed in which the individual items of the bill are checked as to whether the rate information charged by the communication carrier service providers matches the rates which have been either negotiated or established by a third party. Any discrepancies noted in this comparison process are included in a dispute report which is associated with the invoice on which the billed charges appear. The user of the system may then review the invoices in conjunction with any discrepancy amounts which have been noted. An automated payment module then provides for the electronic transfer of funds to the communication carrier service provider for approved invoices.

28 Claims, 18 Drawing Sheets



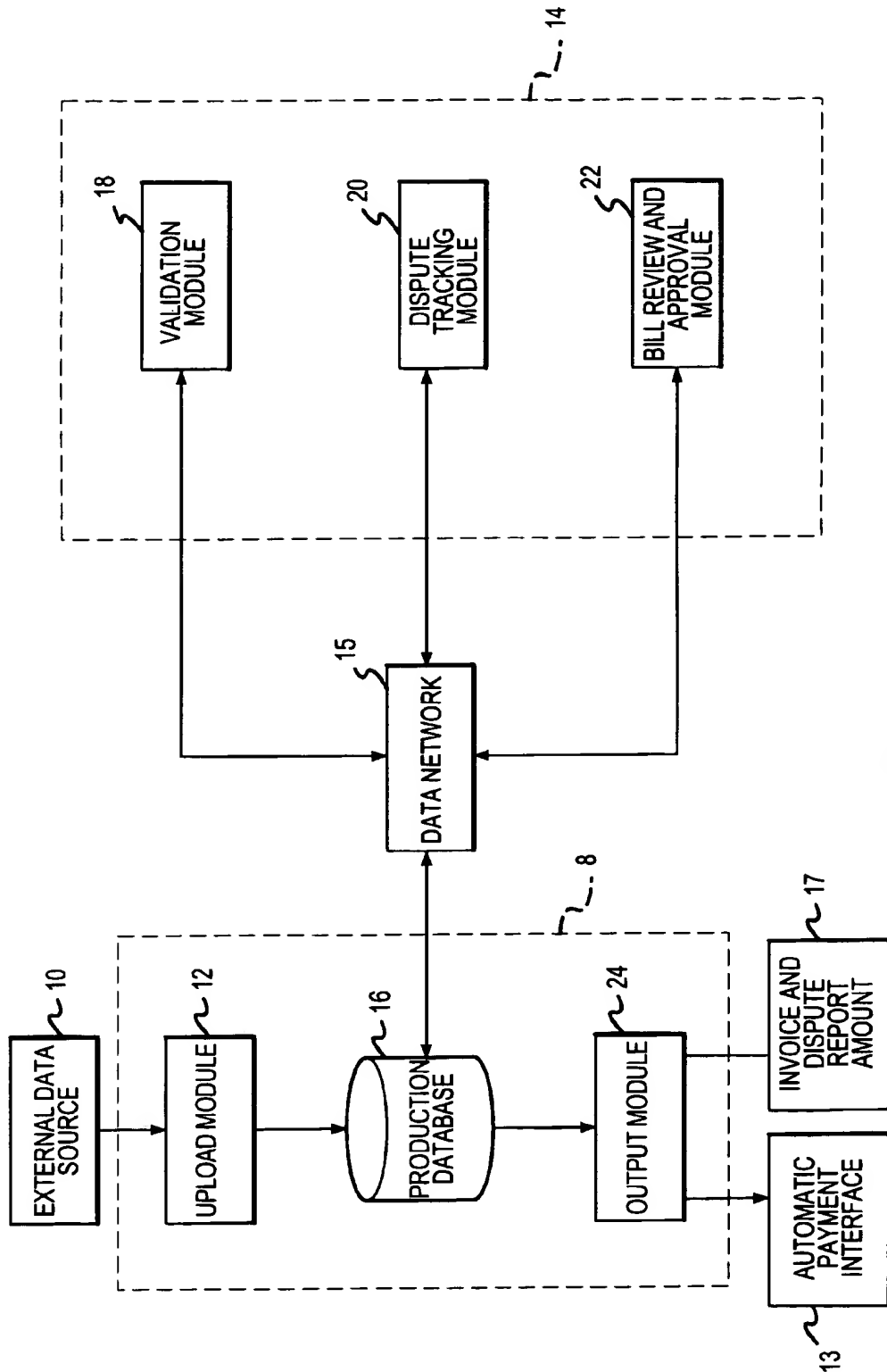


FIG. 1

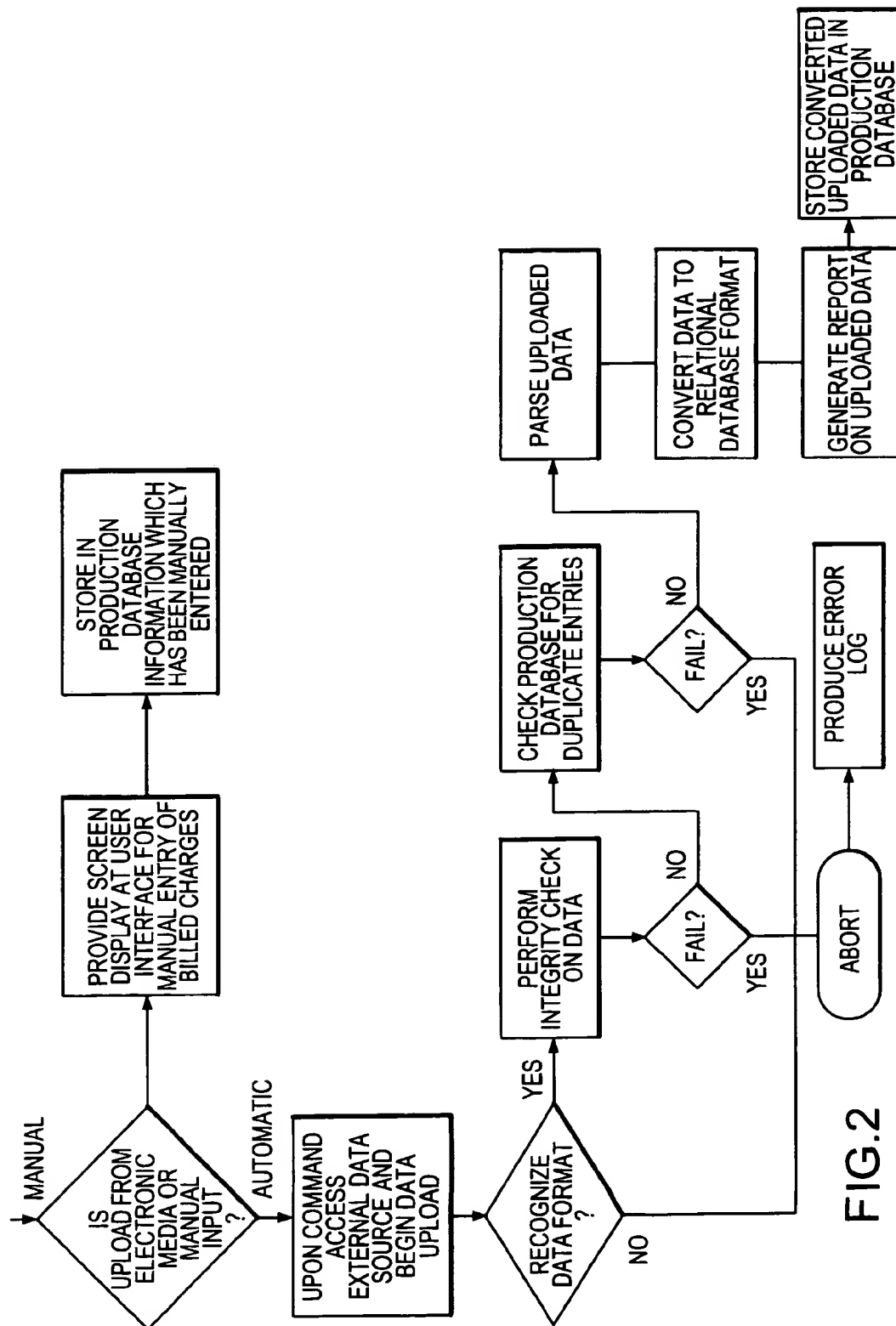


FIG. 2

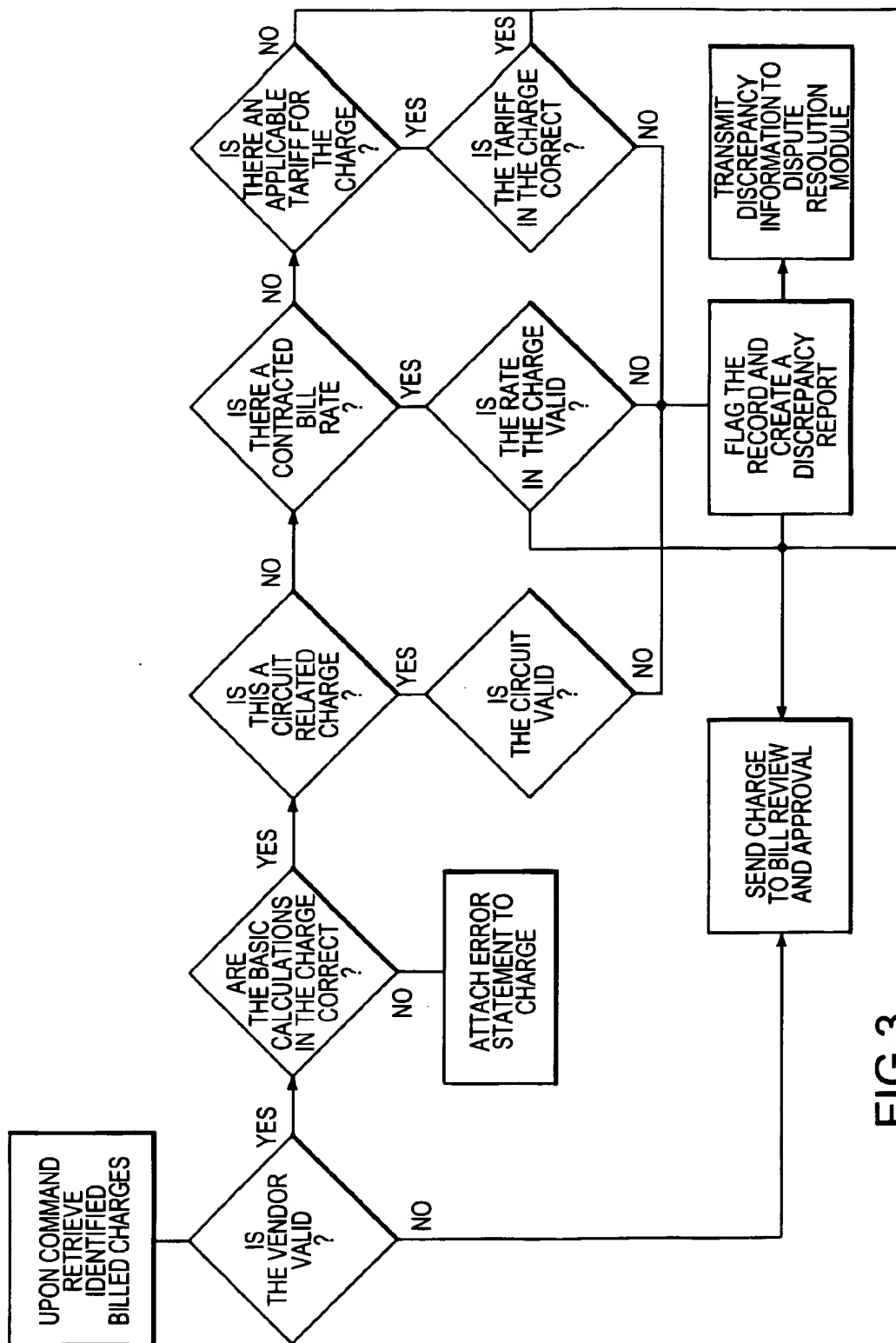


FIG.3

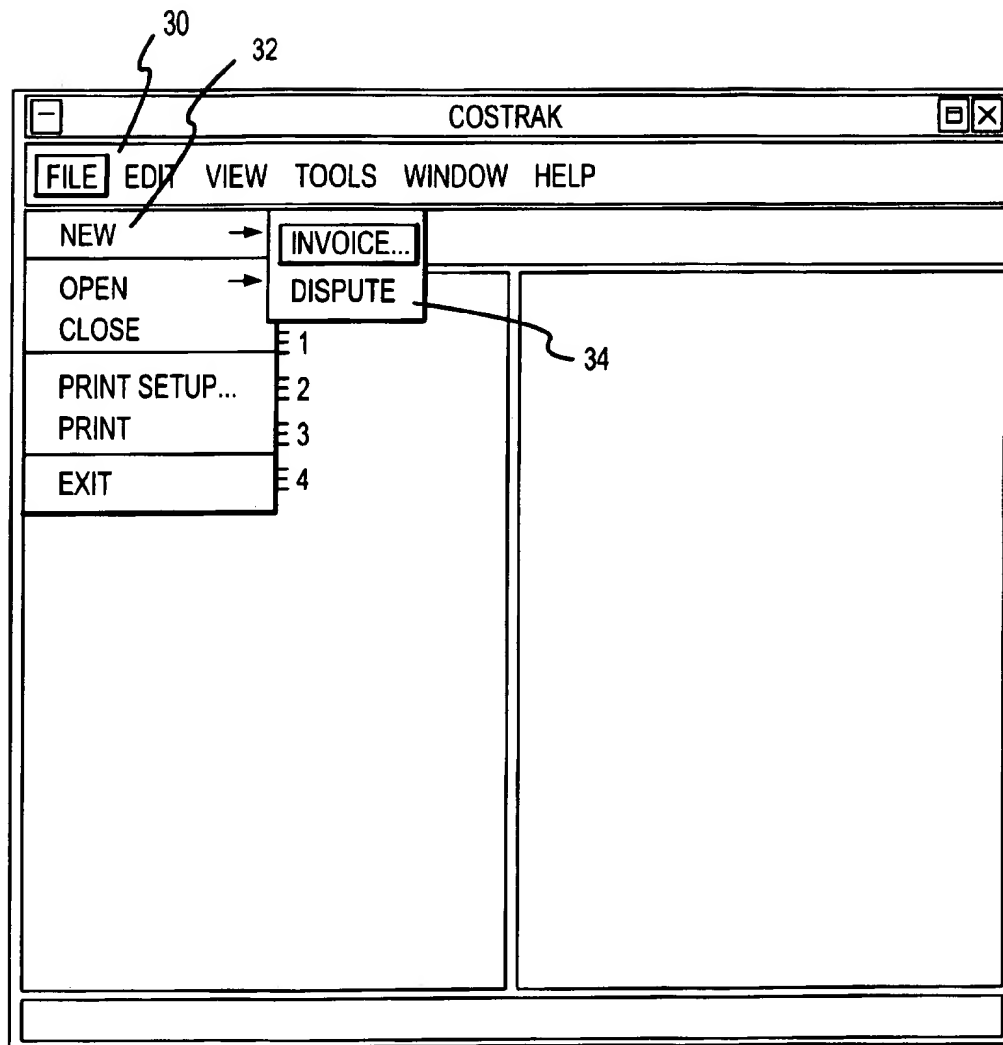


FIG. 4

The figure shows a standard Windows-style dialog box. The title bar at the top contains the text "DISPUTE DEFINITION [TEST:0]" and standard minimize, maximize, and close icons. The main area of the dialog contains five labeled input fields stacked vertically: "NOTICE #", "VENDOR #", "BAN #", "COMMENT", and "STATUS". Each label is positioned to the left of a rectangular text entry box. The "STATUS" field includes a small downward-pointing arrow icon on its right side, indicating it is a dropdown menu. At the bottom of the dialog, centered, are two buttons: "OK" and "CANCEL".

FIG.5

46

48

FIND

| | | |
|-----------------------|---|--------|
| TOTAL DISPUTED AMOUNT | > | \$ 500 |
| NOT USED | | |
| NOT USED | | |
| NOT USED | | |
| NOT USED | | |
| NOT USED | | |

FIND CLOSE

FIG.6

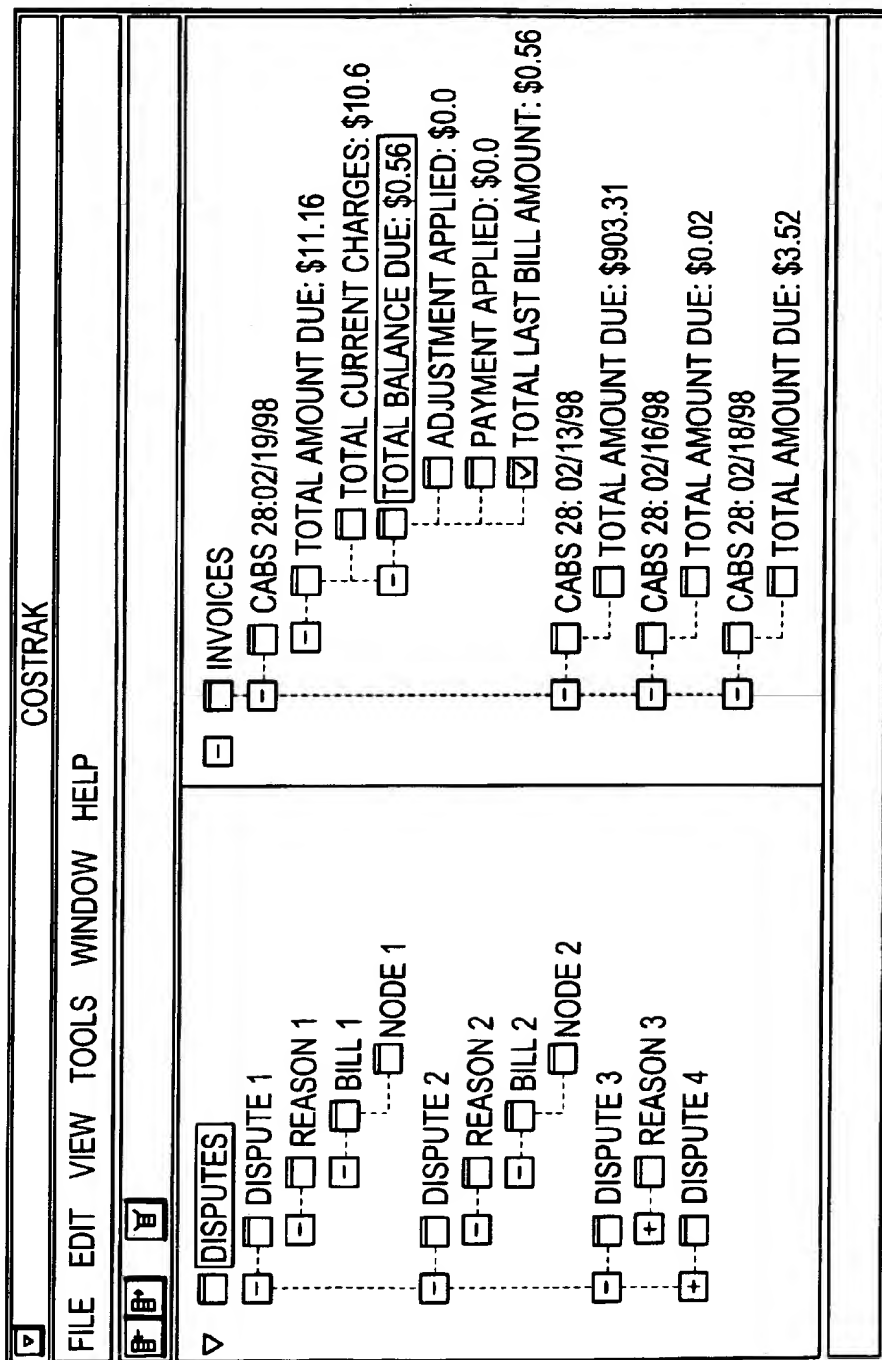


FIG.7

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DISPUTE DEFINITION

38 INVOICE NODE TOTAL BALANCE DUE (DISPUTE CHILDREN)

40 DISPUTE AMOUNT 100.0

REASON CODE INCORRECT TAX RATE

42 COMMENT UNINITIALIZED

OK CANCEL

FIG.8

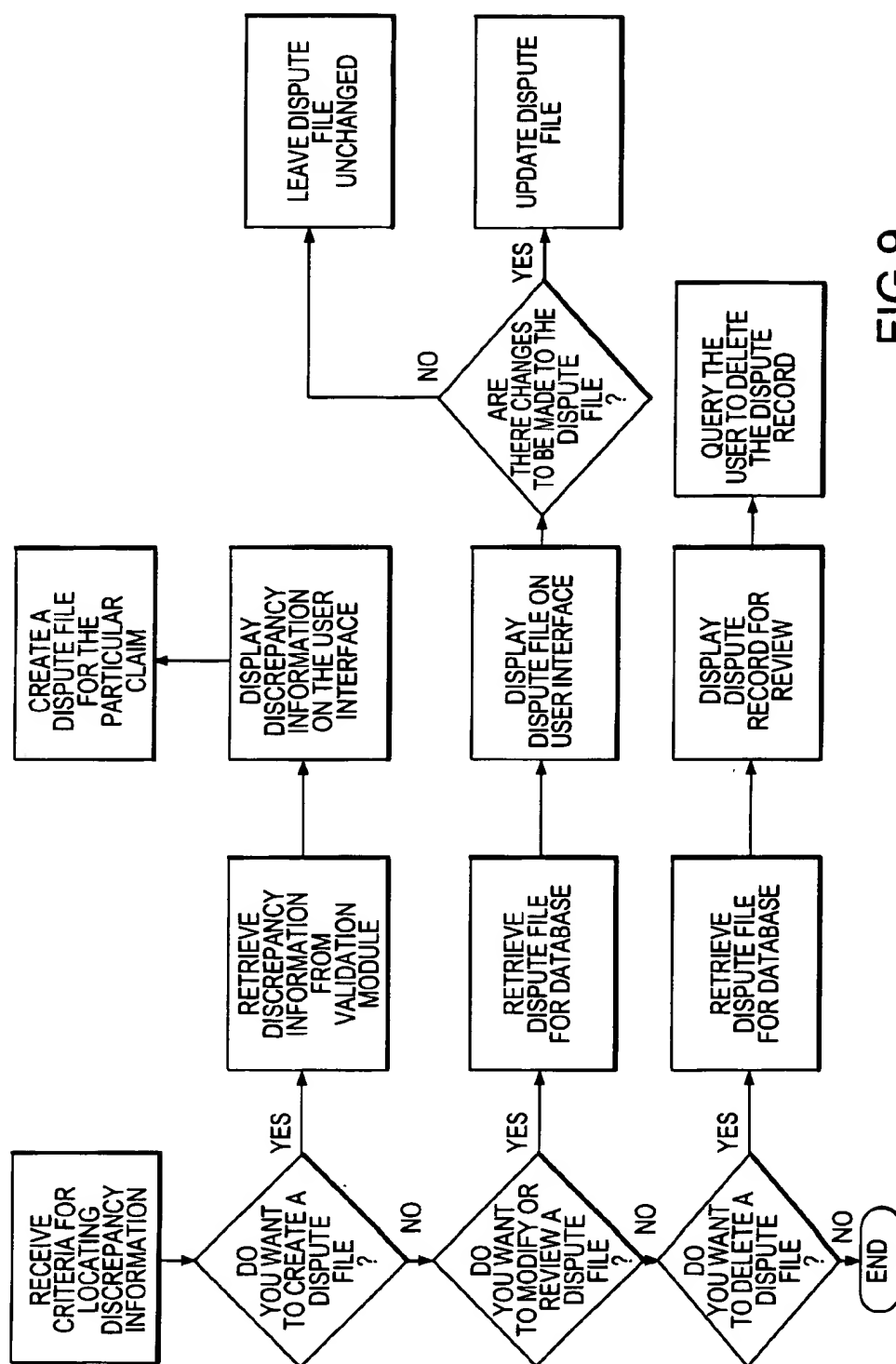


FIG. 9

50

52

OPEN

| | |
|-------------------|-----------|
| TOTAL BILL AMOUNT | < \$ 1000 |
| NOT USED | |
| NOT USED | |
| NOT USED | |
| NOT USED | |

☐ CLOSE CURRENTLY OPEN ITEMS

OK APPLY CANCEL

FIG. 10

| INVOICE PROPERTIES | | | |
|--------------------|-----------------|-------------|-------------------------------|
| ACCOUNT NUMBER: | STATEMENT DATE: | FORMAT: | <input type="checkbox"/> PAID |
| 10021001-1 | 05/19/1998 | 0 | |
| STATUS: | INCOMPLETE ▼ | | |
| ASSIGNED TO: | 11 ▼ | | |
| VENDOR: | 0 | XX VENDOR ▼ | |
| | | BAD OWNER | |
| TOTAL DUE: | 0.00 | | |
| DISPUTE AMOUNT: | | | |
| APPROVAL AMOUNT: | | | |
| OK | | CANCEL | |

FIG.11

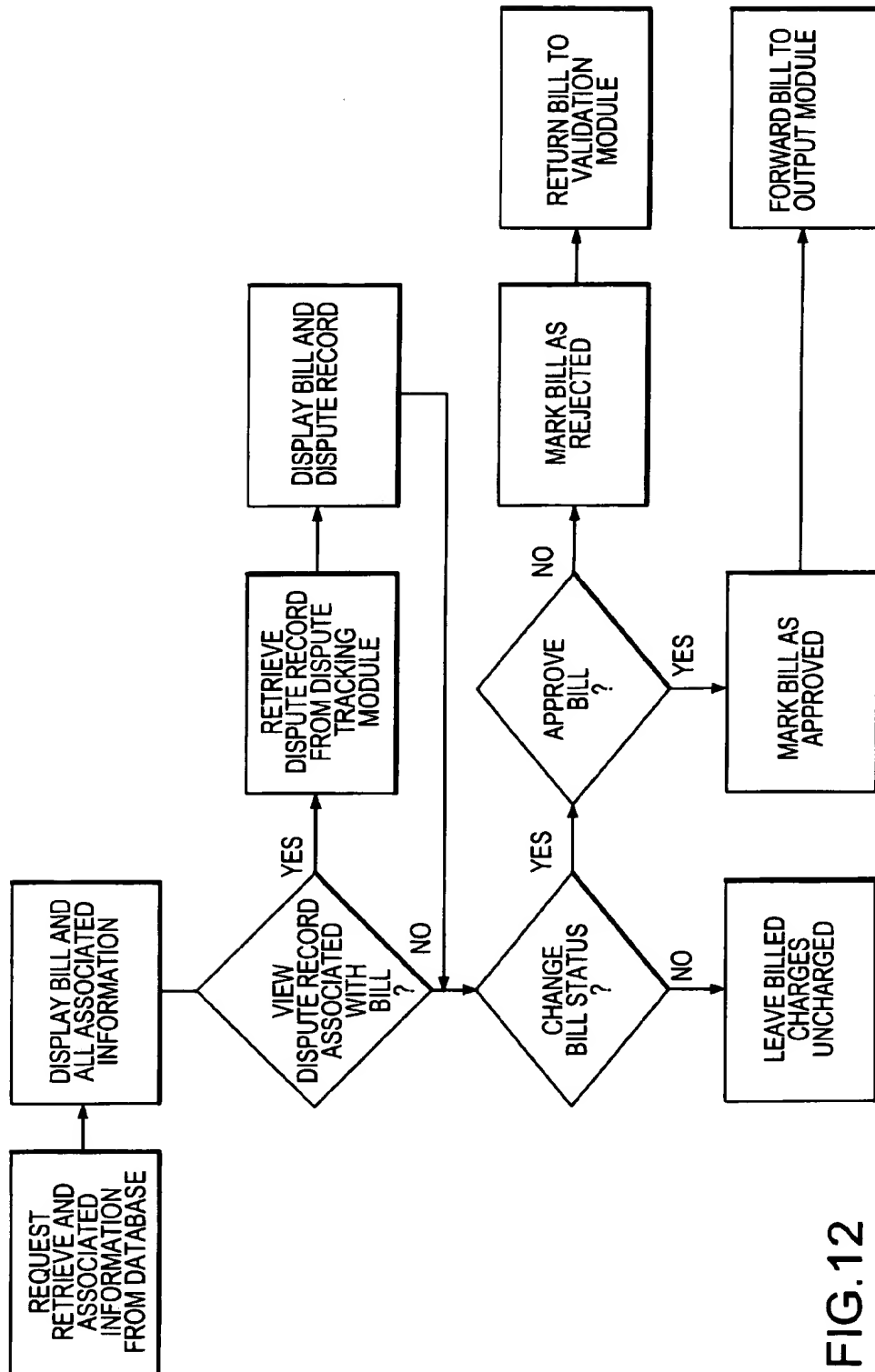


FIG.12

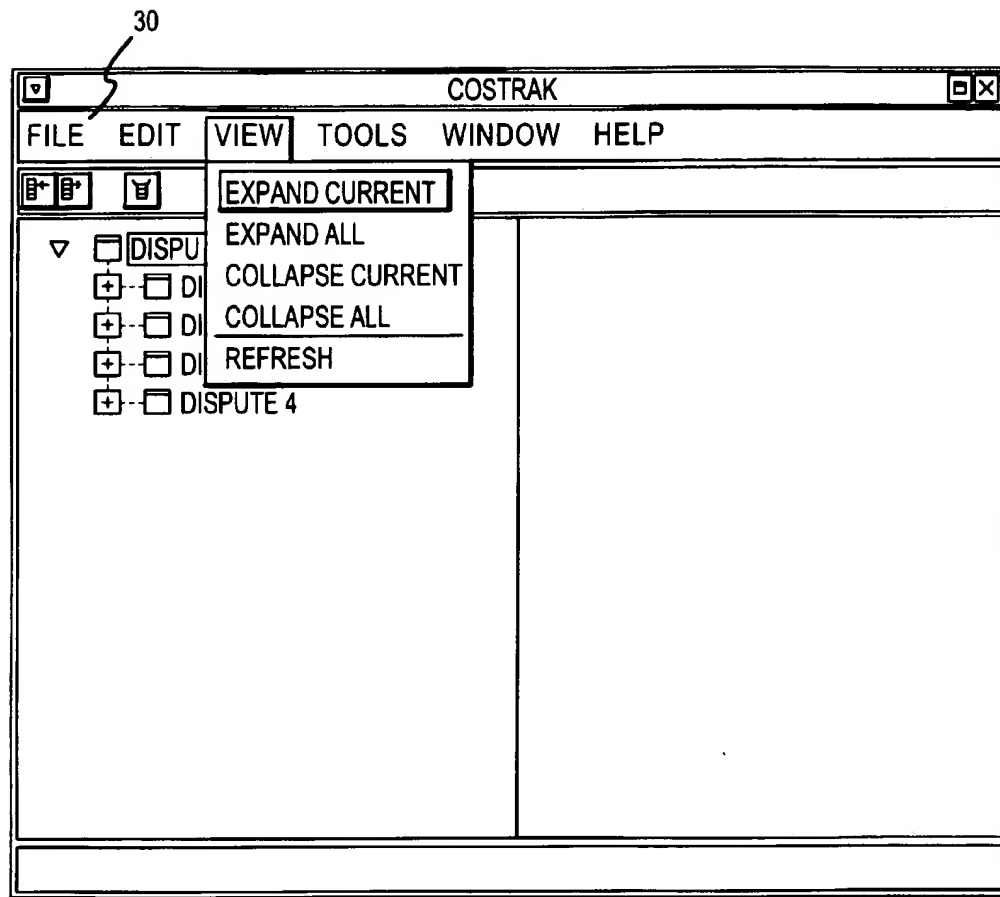


FIG.13

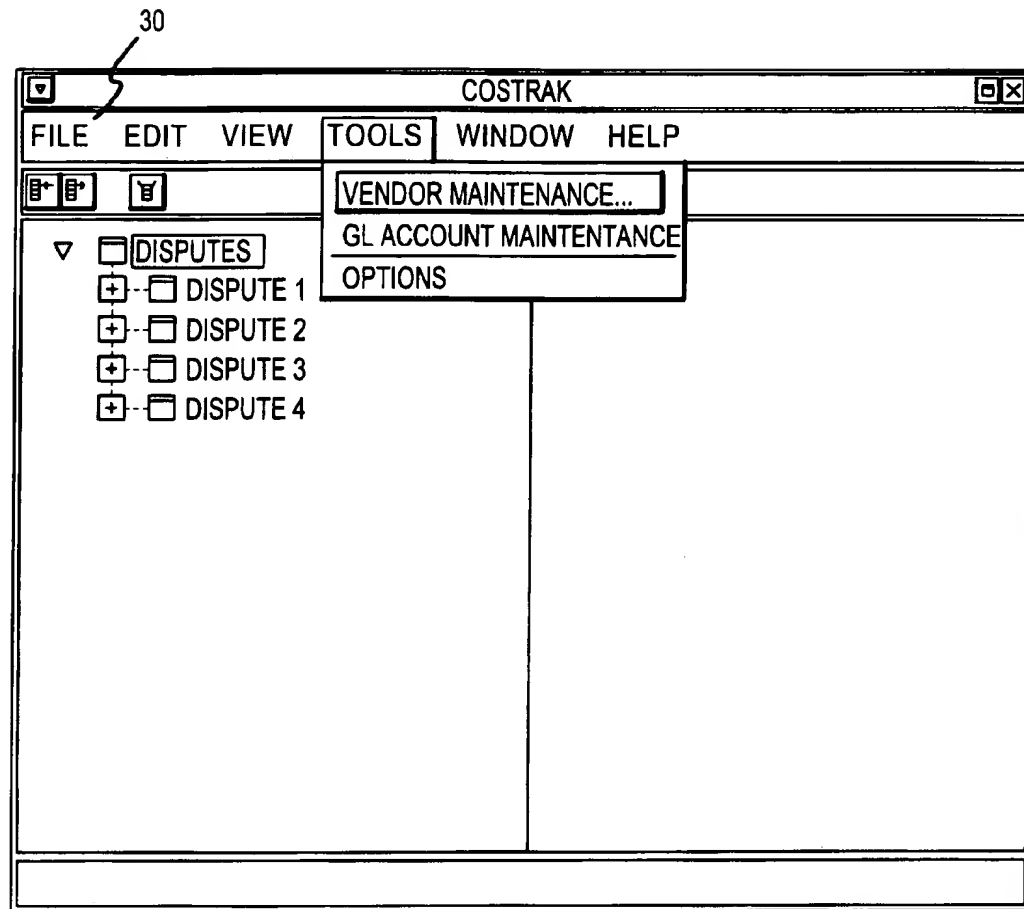


FIG.14

| VENDOR | |
|--------------------------------|---|
| FIND: | <input type="text"/> |
| VENDOR NUMBER: | <input type="text" value="10098"/> |
| VENDOR NAME: | <input type="text" value="VENDOR"/> |
| ADDRESS: | <input type="text" value="134 ELM STREET"/> |
| | <input type="text" value="SUITE 3400"/> |
| | <input type="text"/> |
| CITY: | <input type="text" value="CHICAGO"/> |
| STATE/PROVINCE: | <input type="text" value="IL"/> |
| POSTAL CODE: | <input type="text" value="80119"/> |
| <div>OK NEW CANCEL</div> | |

FIG.15

G/L ACCOUNTS

FIND:

ACCOUNT NUMBER:

DESCRIPTION:

CREATE

OK **CANCEL**

FIG.16

| FIND | |
|-----------------------|----------|
| TOTAL DISPUTED AMOUNT | > \$ 500 |
| NOT USED | |
| NOT USED | |
| NOT USED | |
| NOT USED | |
| NOT USED | |

FIND CLOSE

FIG.17

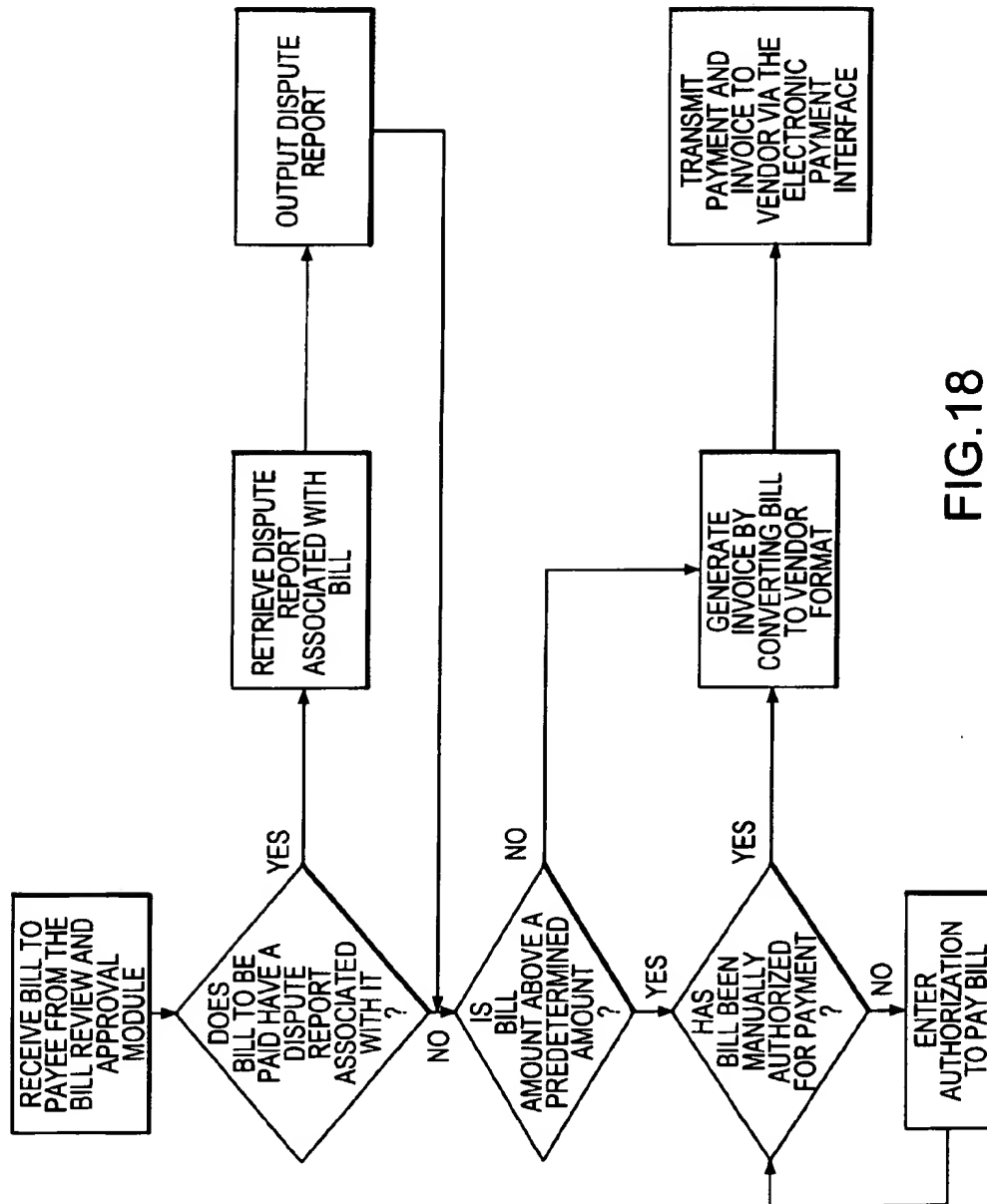


FIG. 18

TELECOMMUNICATIONS ACCESS COST MANAGEMENT SYSTEM

FIELD OF THE INVENTION

The present invention relates generally to billing systems, and more particularly, to a system for verifying charges between communication carrier service providers.

The system is particularly apt for use in automatically verifying, paying and/or analyzing billed charges between telecommunication carriers.

BACKGROUND OF THE INVENTION

The provision of communication services to businesses and individuals often entails the transmission of voice, image and other data via the use of communication devices maintained by different communication carrier service providers. While the provision of such communication services may be adapted to appear "seamless" to users, e.g., via consolidated billing by a single carrier to its customer, the underlying cross-carrier services are in fact billed between the cooperating service providers on a periodic basis.

By way of primary example, multiple telecommunication carriers may be utilized to complete a given long distance call between two remote locations. The call may be initiated by a caller via interface with the caller's local telephony carrier service provider, transferred for interstate transmission to a long distance service provider, and further transferred to a local telephony service provider for the called party. In such an arrangement, while the caller's local telephony carrier service provider will bill the caller for charges associated with the call, the long distance service provider and called party local telephony carrier may bill the caller's local telephony service provider. The amount charged between various communication carrier service providers may be as per regulated rates and/or agreed upon contract rates, and may further depend upon a variety of other considerations (e.g., volume of communications between carriers, time-of-day of communications between carriers, degree of special access between carriers, bandwidth allocated for communications, etc.).

As will be appreciated, given the ever-increasing volume of communications involving multiple carriers, the handling of cross-carrier billings can be quite complex. Concomitantly, the validation, payment, and analysis of such cross billings can be burdensome, particularly in view of highly labor-intensive techniques currently employed to provide such functionality.

SUMMARY OF THE INVENTION

Described herein is a system and method for improved handling of billed charges between communication carrier service providers. The system contemplates an arrangement in which a first communication carrier service provider is billed for services by a second communication carrier service provider, the billed charges most typically received in a first digital file format. Of importance, the billed charges include a plurality of entries which have a corresponding billed charge rate components. In one aspect of the invention, when the first carrier receives the billed charges, corresponding reference charge rates are automatically retrieved from a database maintained or otherwise readily accessed by the first carrier. The billed charge rates and the reference charge rates are then automatically compared in order to determine if a discrepancy exists therebetween.

The system described herein may include a processor which may access data (e.g., billed charges) from a plurality

of different types of storage media in accordance with preprogrammed instructions and/or in accordance with inputs from at least one graphical user interface (GUI). In conjunction with accessing the billed charges, the billed charges may be initially uploaded from the storage media to an upload module in the processor. The option also exists for manually loading the billed charges into the upload module through the GUI. Once the information has been uploaded, a variety of analyses may be performed.

In one arrangement, an integrity check is performed on the billed charges to confirm that no corrupted data has been transmitted. A duplicate billing check is also performed to be sure that the billed charges currently being received are not duplicates of charges previously transmitted. After these checks have been performed and the incoming billed charges have been parsed, a conversion process may be performed in order to convert the bill data into a second digital file format which can be processed internally by the system (e.g., via relational database management techniques). A report may also be generated documenting the upload and conversion of the billing information. When the data upload/conversion is complete, both the report and the billed charges are loaded into a production database.

Once in the database, a validation process may be performed to check the actual charged rates against reference charge rates. The reference charge rates may be negotiated between the parties or previously established by third parties (e.g., regulatory agencies). The billing information is retrieved from the production database and comparisons are made between what the second service provider charged versus what the first service provider has identified as the appropriate reference rate. Also, this comparison is made for the tariffs or other third-party established rates. At this point, any discrepancies between the actual charged rate and the reference rate are noted.

The validation process may be performed by an automatic validation module incorporated in the graphical user interface. The process may be performed automatically after the billed charges have been uploaded to the database. The automatic validation module includes all the criteria necessary in order to validate the billed charges. The automatic validation module may be configured such that the first service provider may program in selected requirements for performing the validation process.

The discrepancy information which is generated in the validation process may then be used in a dispute-tracking process. For example, for billed charges in which a discrepancy is noted, a dispute report may be generated which includes the discrepancy amount. A dispute tracking module may be included in the GUI which provides the system user with a number of displays which may be used to enter comments and other information relating to the dispute report. Once the dispute report is generated, the system user is provided the functionality to associate the billed charges with the dispute report. The system user may also update, amend or resolve any dispute reports which have been previously generated for other billed charges.

Once a dispute report is generated for the billed charges, a system user may be provided the opportunity to either approve or disapprove an invoice, which the billed charges are part of, through a bill review and approval process. A bill review and approval module may be incorporated into the GUI which provides the system user the ability to access and display invoices along with dispute reports. In one aspect of the invention the invoices and dispute reports are displayed to the system user in a hierarchal structure. By using the

computer mouse, the user may select subcategories of the invoices and dispute reports to reveal additional information about a particular matter. Invoices and disputes may be associated through the dragging and dropping of a particular invoice on top of a particular portion of the dispute report.

Once all the billing and dispute information has been reviewed, the system user may either approve payment for the invoice or may reject the invoice and have it returned to the validation process. If the invoice is disapproved, the system user can insert notes in the invoice as to why it was rejected. If the system user approves the invoice in the bill review and approval module, that invoice is then forwarded for automatic payment. The user may approve the billing information even if a dispute report has been associated and can order that a reduced amount be paid which reflects the discrepancy noted.

Once an invoice has been approved for payment, an autopayment process can be triggered to electronically pay the invoice. An automatic payment module may be incorporated into the processor. As part of the autopayment process, a precautionary procedure may be used which requires a certain "level" of approval (e.g., by upper management personnel) to pay the invoice if the charges exceed a predetermined amount. In the case where a dispute report has been attached to the invoice, the short pay amount may be electronically transmitted to the vendor, and the dispute report otherwise provided to the vendor for review. Once a dispute report is resolved, the status of this report may be changed in the dispute-tracking module.

Numerous additional aspects and advantages of the present invention will become apparent to those skilled in the art.

DESCRIPTION OF THE DRAWINGS

FIG. 1 discloses a system diagram for a cost tracking system which shows internal and external connections to a cost tracking server and graphical user interface.

FIG. 2 discloses a flow chart which describes the operation of the upload module.

FIG. 3 discloses a flow chart which describes the operation of the automatic validation module.

FIG. 4 discloses a screen display for the main window.

FIG. 5 discloses a screen display for the new dispute window.

FIG. 6 discloses a screen display for locating dispute reports.

FIG. 7 discloses a screen display for the main window which includes located dispute reports and invoices.

FIG. 8 discloses a screen display for the definition of a dispute report.

FIG. 9 discloses a flow chart which describes the operation of the dispute tracking module.

FIG. 10 discloses a screen display for locating invoices.

FIG. 11 discloses a screen display which lists invoice properties.

FIG. 12 discloses a flow chart which describes the operation of the bill review and approval module.

FIG. 13 discloses the functionality included in the view pull down of the main window.

FIG. 14 discloses the functionality included in the tools pull down of the main window.

FIG. 15 discloses a screen display for providing vendor information.

FIG. 16 discloses a screen display for providing account information.

FIG. 17 discloses a screen display which provides for searches of information currently displayed in the main window.

FIG. 18 discloses a flow chart which describes the operation of the output module.

DETAILED DESCRIPTION

Disclosed in FIG. 1 is a system diagram for the cost tracking system which shows in particular the internal and external connections for processor 8 and graphical user interface 14. The processor 8 may be implemented as a UNIX or NT server which may establish ODBC TCP/IP connections over a data network 15 with remotely located processing devices. The data network 15 may be the Internet, an intranet, or any type of node based computer system. Within the processor are upload module 12, production database 16, as well as the output module 24. These elements will be discussed in greater detail below.

Also shown in FIG. 1 is graphical user interface (GUI) 14. In one embodiment of the invention the GUI is a personal or other stand alone computer which may operate in the NT or Windows 95 environment. The GUI includes the capability to display information, allows the system user to initiate commands, and provide for the manual input of data. Communication between the GUI 14 and the processor 8 is established over a ODBC TCP/IP connection established over data network 15. The system diagram in FIG. 1 shows the use of a single GUI for explanation purposes only. The cost tracking system described herein may incorporate multiple GUI's. The GUI 14 further includes validation module 18, dispute tracking module 20, and bill review and approval module 22. These modules will be described in greater detail below.

The cost tracking system, as described herein, substantially automates the bill processing by a customer for charges made by a vendor for use of its' equipment or services. The embodiments described herein refer to the billing procedures for telephony services, however one skilled in the art would realize that the system described herein may have applications which extend beyond this particular area of business and technology. As is well known, there are many different communication service providers which provide telephony services for individuals and businesses. These providers may not own all the communication lines which are used in order to provide their services. For example, a long-distance phone carrier in most cases does not own the local phone lines but, instead, must obtain access to these lines through a vendor. Agreements are established between the long-distance carriers and the local phone companies for use of particular lines. Periodically, the vendor will send the customer a bill which includes charges for use of its lines. The system described herein substantially automates the processing and payment process for these billed charges.

Referring again to FIG. 1, a number of additional elements are shown to have external connections with the processor 8. One connection is made to external data source 10. External data source 10 represents the submission of the billed charges by the vendor to the customer. The vendors may submit the billed charges through a variety of means. Some examples are CD-Rom's, diskettes, 9-track tape, cartridge tape, and electronic file transfer. The information on these different media may be in a number of different formats. Some examples of possible data formats are CABS, CENTREX, AEBS, CRIS, as well as any custom formatted carrier electronic bill data.

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Two other connections from the processor are made to autopayment interface 13 and the invoice and dispute report output 17. The autopayment interface 13 facilitates the automatic payment of approved charges through electronic or other means. The invoice and dispute report output provides copies of invoices and dispute reports to the vendor. One implementation for the invoice and dispute report output 17 is a printer which provides these items in hard copy format. These items may also be provided in an electronic document format.

As was mentioned above, the processor 8 includes a number of internal elements. Upload module 12 performs the function of uploading the billed charges from external data source 10. In addition, this module performs a variety of data analysis functions on the uploaded information, and converts the information from whatever format it is received to a relational database format. Once this conversion is complete, the billed charges are stored in production database 16. Database 16 is a relational database which contains multiple tables which are searchable by the system user. This database may be implemented in a number of relational formats which may include Oracle, Sybase, or any other relational database software. Also stored in the production database is variety of reference information which may be used by other components of the system to perform analysis on the billed charges.

The processor 8 further includes output module 24. This module provides for the processing of billed charges once they have been approved for payment. This processing may include the initiation of autopayment for the charges as well as the outputting of any necessary documentation about the transaction.

GUI 14 also includes a number of internal processing modules. The automatic validation module 18 retrieves the converted billed charges from the production database and performs a variety of processes on the billed charges which includes a check on the validity of the vendor making the charge, the detection of any discrepancies in the billed charges received when compared against reference information in the production database, and the calculation of any discrepancy amounts.

Any discrepancies detected in the automatic validation module are further processed in dispute-tracking module 20. The dispute-tracking module 20 creates a dispute report which describes the discrepancy and discrepancy amount. This dispute report is then associated or otherwise connected with the billed charges. The bill review and approval module 20 receives the billed charges, and within this module, the user of the system may access the billed charges and review any of the charges made by the vendor. The user can also access any dispute reports which have been generated at the dispute-tracking module 20. At the bill review and approval module 22, the user may either approve payment of the billed charges or reject the bill and return it to the database for further review in automatic validation module 18.

In one embodiment of the invention, modules 18, 20, and 22 are part of a cost tracking software package which is downloaded on to the GUI. This software may operate in the Windows 95 or NT environment. Through the connections established over the data network from the GUI to the processor, these modules may be used by the system user to access, perform searches, and retrieve data from the production database 16. The production database includes the necessary logic to facilitate this access.

In operation, billed charges from a vendor are uploaded from the external data source and received at the upload

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module 12. The upload module 12 provides the capability to upload data generated by a vendor's billing system into the production database. The uploading of data may be incorporated as an automatic function for processor 14. The system user may program the server to make inquiries of the external data sources as to whether there is data available to upload. This process may also be initiated manually by the system user through a command submitted through the GUI. During the upload of the vendor's billed charges, the upload module performs data integrity and format integrity error checking on the uploaded information and prevents corrupted data from being uploaded into the system. The upload module also queries the production database to ensure that duplicate charges are not loaded into the system. Finally, the upload module records information pertinent to the load (time, duration, number of records) and associates that data to the billed charges being loaded in order to track receipts of vendor's bills.

The flow chart in FIG. 2 describes in detail the steps performed in the data upload process. At the beginning of the process, a query is made as to whether the uploading of the billed charges will be an automatic or a manual process. If the process is manual, the user of the system pulls up the desired screen display through the GUI and enters the appropriate information for the vendor. This information is already in the relational database format so it is stored directly in the production database. If the upload of information is from an electronic media or other electronic source, the upload of the information from the external data source 10 is initiated. After the information is uploaded to the upload staging database, a first query is made as to whether the billed charges are in a recognizable format. As was described above, the vendors may store their billed charges in a particular electronic format which the processor, and more specifically, the upload module needs to translate in order to store the information in the production database. If the information format is not recognizable, the process is aborted and an error log for this step is produced. If the information is in a recognizable format, an integrity check is then performed. This check is performed to be sure that no corrupt data is loaded onto the production database. If corrupted data is detected, the process fails and the download is aborted. If the data passes through the integrity check, the upload module performs a scan of the billed charges which have already been downloaded onto the production database to be sure that none of the entries are duplicates of billed charges already in the system. If any duplicates are detected, the process fails and the upload is aborted.

If the data passes through the integrity and duplicate entry check, the information stream is then parsed into individual billing entries. Each data format has its own header information which the upload module translates and uses to properly parse the information. Once this step is complete, the upload module converts the billed charges from their uploaded format to a relational database format for storage onto the production database. A number of relational database formats can be used for this particular process. These formats may include Oracle, Sybase, or any other known relational database software. After the conversion process is complete, a report is generated on the uploaded and converted billed charges and the information is then stored in the production database. The upload logs are populated with data which includes the upload times, durations, and number of records read by type.

Once the billed charges have been properly converted and stored in the production database, the analysis of the billed

charges may begin. A first portion of this analysis is done in automatic validation module (AVM) 18. The basic function of the automatic validation module is to perform comparisons between the billed charges and reference information previously stored in the production database. This reference rate information includes such things as rates agreed to by the parties for use of the circuits as well as any tariffs established by third parties. The automatic validation module provides the user with the ability to query the database for detailed billed items using multi-dimensional criteria across billing account numbers (BANs) and bill dates. This criteria may include all charges for a particular vendor over a particular time period or it may be narrowed down to a particular charge. The AVM has access to contract data, any circuit mileage and rate data to support mileage rate calculations where applicable, circuit and inventory data to support charge validation by circuit, and PIU (percents interlate utilization) data to support PIU discounting. This module also allows bulk dispute item selection and flagging and allows the customer to maintain a comprehensive catalogue of reason codes that are associated to disputable bill items. Additional functionality may include the re-analysis of billed charges which have gone through the system once and have been disapproved for payment.

The automatic validation module described herein includes the functionality to accept custom programming. The module is programmable by the system user to perform the validation process according to unique requirements established by a particular client. This programming can be done through the GUI. For example, any of the criteria described above, such as contracted rates and tariffs, that are used in the validation the billed charges may be changed based on the requirements of the party performing the analysis. The AVM is designed such that the user may interact with and maintain client specific requirements through the GUI.

The AVM also has capability to produce and store summary reports for the billed charges processed by the AVM. These reports may include information relating to the number of validation errors found by reason code and in total. The summary reports of the validation processing may also provide information relating to cycle breakdown of billing errors found in each invoice processed, breakdown of error codes by type, dollar amounts, number of errors types found, etc.

Disclosed in FIG. 3 is a flowchart which describes an example process which may be used to analyze billed charges for a communications service provider. Upon a command by the user or through an automated process, the automatic validation module accesses the production database and uploads the billed charges which have been identified through user established criteria. This criteria may include the particular vendor, a particular billing entry, a particular circuit, as well as the re-analysis of a bill which had been disapproved for payment. The production database provides for searches using a variety of different search terms. After the billed charges have been uploaded, a query is made as to whether the vendor is valid. Included in the production database is a list of vendors which have provided services to the customers. If the vendor is not on the known or approved vendor list, the bill is sent directly to the review and approval module. If the vendor is identified, the module performs a check on the billing statement to confirm that, based on the vendor provided usage rates, the charges shown are correct. If these charges are not correct, an error statement is attached to the billed charges. A query is then made as to whether the billed charge is related to use of a particular

circuit. If this is a circuit charge, another query is made as to whether the circuit is valid. According to agreements made between the parties, access is provided to particular circuits according to certain terms. After certain amounts of time, circuits may be deactivated or access is denied to that circuit. The circuit validity check determines whether the customer is being billed for accessing a circuit which had been deactivated or was not accessible by the customer.

If it is determined that the circuit is invalid, the billed charge is flagged so that a discrepancy report can be generated. If the circuit charge is valid, a check is then made as to whether there had been a contracted rate between the parties. The parties will enter into agreements charging particular amounts for the use of particular circuits. If the rate charged is not valid according to the reference charge rates stored in the production database, the billed charge is flagged, and a discrepancy amount is calculated. If the rate is valid and all other information check outs in the bill, the billed charge is sent to the bill review and approval process.

If there had been no contracted usage rate between the parties, a final query is made as to whether there is an applicable tariff for the charge. Governmental entities or other third parties may impose a tariff or other charges on the use of particular services within their jurisdiction. If there is a tariff associated with the billed charges, this tariff rate is compared against a reference rate stored in the database. If the tariff rate is not correct, it is flagged, a discrepancy is calculated, and this discrepancy information is transmitted to the dispute tracking module. If the tariff charges agree, the billing information is transmitted to the production database for access through the review and approval module. Any discrepancy information which had been calculated in the automatic validation module is transmitted to the production database so that it may be retrieved through the dispute tracking module 20. The dispute tracking module 20 provides the capability to create, package, and track disputes. It allows the system user to query the database for disputable items across a number criteria, which includes BAN's and bill dates, and then include those various details in a dispute report. That dispute report then becomes an entity within the system, which can be tracked, reviewed, and finally closed after resolution with the vendor with whom the dispute is being pursued. The dispute report is linked to the billed charges from which it was created, and is viewable from other modules in the processor.

In order to create a dispute report from discrepancy information, the system user, from the GUI, first accesses the main window screen for the cost-track system. The main window is the screen display which provides the starting point from which all screen displays discussed herein are accessed. The main window is also the screen display which is returned to when the other screen displays are closed out. This screen is shown in FIG. 5. In this main window, there are a number of pull-down menus which the system user can access to perform a variety of functions. In the case where the system user wishes to create a new dispute report, the user would first select the file on toolbar 30, and then select new 32, and then dispute 34 from the pull down menus. Once these selections have been made, the screen display disclosed in FIG. 5 is provided for the system user.

The screen display shown in FIG. 5 provides the system user a mechanism to enter information about the dispute report to be created. This information to be input may include such things as Notice #, Vendor #, BAN # and any other relevant information. Once the creation of the dispute report is complete, it appears on the main window. FIG. 7 discloses a screen display of the main window which

includes a series of dispute reports which have been created. All the dispute reports shown in the left hand column are arranged in a hierarchial structure. Beneath each dispute are a number of subcategories containing information about the dispute. By using the mouse and left clicking on any of these reports or subcategories, additional subtopics are displayed. Right clicking on any of these icons in the hierarchal structure will initiate the display of a screen which contains specific information about the item in question. For example, shown in FIG. 8 is a dispute definition screen for a particular dispute. Included in the detailed information are items such the node selected from the dispute report hierarchy 36, the disputed amount 38, a reason code 40, and any comments included in the dispute report 42. When the user is finished viewing the dispute report information, the okay button may be selected and the system user is returned to the main window. The informational screen displays for a particular dispute, may also be used to amend information within the dispute report.

Returning again to the main window screen display disclosed in FIG. 4, a system user may also access dispute reports which have already been created in order either amend or delete these reports. Under the file block 30, the system user would choose open and then dispute. Once this choice is made, the screen display disclosed in FIG. 6 would appear would and provide the user with various subject areas in which to search for disputes. The system user may choose the pull down menu 46 which discloses a number of subject headings in which to search. These headings may include dispute report number, total disputed amount, particular vendor, BAN, as well as a variety of other topical headings. The scope of the search may be limited by entering information in block 48, and once the user presses okay, a list of dispute reports which match the search criteria are displayed in the main window screen display.

FIG. 9 describes in detail the steps performed by the dispute tracking module. As was described above, the dispute tracking module is provided access to discrepancy information generated by the automatic validation module. Upon receipt of this information, the system user may then generate a dispute report. If the user wants to create a dispute report for a discrepancy detected in the billed charges, the module retrieves this discrepancy information. The discrepancy information is displayed to the system user and a screen display is provided to enter a dispute description. After this dispute description is entered, the module associates all of the appropriate billing information, vendor, BAN, dates, etc. in the dispute report. This information provides the connection between the billed charges and any discrepancies which have been detected. This dispute report then can be stored in the production database.

As described above, the dispute resolution module also provides the opportunity to modify, review, or delete a dispute report. If the user wants to modify or review a dispute report, the user enters the information through the GUI and the dispute module will retrieve the particular dispute report from the production database. This retrieval of a dispute report can be done in conjunction with functions being performed in other modules in the cost tracking processor 8, for example the bill review and approval module 22. Once the dispute report has been retrieved, it is displayed in its hierarchal structure through the GUI. The system user is then provided the option to make any changes or amendments to the dispute report. If the user does not make any changes, the dispute report is left unchanged. If a change is made to the dispute report, the user enters this change through the GUI and it is incorporated into the dispute report.

The user of the system also has the option of closing a dispute report once the discrepancies noted in the billed charges have been reconciled. To begin, the user enters the identifying information for the dispute report through the search function incorporated in the GUI, and the appropriate dispute report is retrieved. The dispute report is displayed and the user of the system, through a particular dialog box on a screen display, may indicate that the dispute has been resolved and this dispute report should be closed. A record of this dispute is kept in the production database and this record includes all information relating to the creation and closing of the dispute.

After the billed charges have been processed in the automatic validation module and any discrepancies noted in the dispute module, the billed charges are combined in invoices for the different vendors, and the system user then approves or disapproves the invoices in the bill review and approval module 22. The bill review and approval module supports the process of reviewing invoices and dispute reports and approving invoice/dispute packages for payment or formal dispute. Using this module, users may view summary information on the charges (including short pay/disputed amounts), link to detailed information on bill items (linked to validation/bill research module), or link to dispute detail (dispute-tracking detail). Finally, the bill review and approval module provides the functionality to associate summary invoice amounts with general ledger codes for accounting and financial tracking.

Before an invoice can be approved, it must first be manually reviewed by the system user. The dispute reports associated with that invoice should also be reviewed. The invoices may be displayed to the viewer in a manner similar to how the dispute reports were displayed. Referring again to the main window shown in FIG. 4, the system user would choose the file block on tool bar 30, then choose the open block 32, and then choose invoice from pull down menu 34. At this point, a screen display will be provided which allows the user to search for invoices. An example screen display is shown in FIG. 10. By choosing the pull down menu 50 in this screen display, the system user can choose from a variety of search areas. These areas may include invoice numbers, vendors, bill amounts, etc. In the example where the total bill amount is the search criteria used, this search can be further limited by entering a maximum value in block 52. Once the search has been completed, all the invoices which meet the search criteria are displayed on the main window. An example of a retrieved list of invoices is shown in FIG. 7. As with the dispute files, all information about a particular invoice are presented in a hierarchial structure. For example, under an invoice CABS 28: Feb. 19, 1998, there are a number of topic headings which include the total amount due, beneath that the total charges and the total balance due, and further beneath that are the total balance due, the adjustment applied, payment applied, as well as the total last bill amount. By right clicking with the mouse on any of these items for information about that portion of the invoice may be viewed. For example, by right clicking on the invoice description portion, a screen display like the one in FIG. 11 is provided. This screen display provides the system user with the current status of the invoice, including any disputed amounts.

One piece of information which may be necessary in order to approve payment of a particular invoice may be whether a particular dispute report is associated with that invoice. Invoices and dispute reports are associated through a manual function performed by the system user. The first step in this process is to display both the dispute reports and

the invoices on the main window. The screen display provided in FIG. 7 shows both the disputes and invoices on the main window. In order to associate a particular dispute with an invoice, the user takes advantage of the drag and drop functionality included in the system. For example, if the system user wishes to associate a dispute 1 with the invoice CABS 28: Feb. 19, 1998, the system user would grab the invoice icon with a left click of the mouse, drag it across the screen and drop it on top of the dispute report icon. From that point on the invoice detailed information will contain a reference to the dispute report to which it has been associated. Conversely, the dispute report will now note discrepancy amounts included in the invoice. The drop and drag functionality described above provides the flexibility to associate multiple invoices with a particular dispute report.

The detailed operation of the bill review and approval module is disclosed in FIG. 12. After a user has accessed the bill review and approval module, the system user requests that particular billed charge be retrieved from the database. After the request is input through the screen display, the billed charges are retrieved from the production database and displayed for the user. As was discussed above, all relevant information including itemized charges and dispute reports are displayed for the system user to review. During the review process the user may request to view the dispute report associated with the invoice. Once this information has been retrieved, it is displayed for the user to review. Once the system user has all the information necessary in order to either approve or disapprove a bill, a query is made as to whether a change of bill status is desired. The system user may choose to leave the bill information unchanged and return to it at a later point.

If the system user does wish to change the status of the bill, the user may approve or disapprove the bill for payment. The system user may mark the bill as approved in at least two scenarios. If there is no discrepancy report associated with this charge, the bill may be marked to be paid. If there is a discrepancy noted and an associated dispute report for this bill, the system user can mark the bill to be short paid and a discrepancy report sent to the vendor. Once these designations have been made, the bill is forwarded to the output module. If the system user decides to disapprove the bill, it is marked as rejected. A dialog box is provided in the invoice for the system user to enter reasons for the rejection. Reasons for rejection may include disagreement with the dispute report and, in particular, disagreement with the noted contract or tariff rates. Once the bill has been disapproved, it is transmitted back to the automatic validation module for further review. Once in the automatic validation module, a system user may assist the automated functions in that module to correct any errors noted in the dispute report.

A variety of other functionality is provided to the system user through the main window. Through the view pull down menus on tool bar 30, the system user has the option to expand a the hierarchial listing for one or all dispute reports and invoices. The option is also provided for collapsing the hierarchial structure for these same items. These options are shown in the screen display disclosed in FIG. 13.

Under the tools pull down menu as shown in FIG. 14, the system user is given the option of reviewing or amending information relating to a particular vendor or a particular account. In the situation where the system user chooses the vendor maintenance option, a screen display, as disclosed in FIG. 15, appears. In the find portion of the screen display, the user may enter a particular vendor, a vendor name, and the desired information for that vendor will appear below. Also with this screen, the system user may enter new vendor information

If system user chooses the GL account maintenance option in the tool pull down menu, the screen display shown in FIG. 16 will be displayed. Through this screen display, the user can search for a particular account using account number or other identifying information. This information is then displayed for the system user. Also through this screen display, the system user may enter new account information.

Additional functionality provided in the main window is the ability to search disputes and invoices which are currently being displayed. Under the edit pull down on tool bar 30, the find function may be selected and the screen display shown in FIG. 17 is provided for the system user. Within this screen display, the user can choose a particular subject area to search within and then in the right hand column enter limitations to that search. The search is only performed on items currently being displayed in the main window.

If the invoice has been approved in the review and approval module, it is then transmitted to output module 24. The output module provides a generalized output format for both the accounts payable/bill disbursement file output (to electronically pay the billed charge via the client's automatic payment system) and also for the dispute report which is sent back to the vendor with whom a dispute is being pursued. These outputs may be either driven by a command entered through the GUI or outputs with an automatic scheduling system.

The flow chart disclosed in FIG. 18 describes in detail the processes performed by the output module 24. After approval in the bill review and approval module, the billed charge is received by the output module. A first query is made as to whether the billed charge to be paid has a dispute report associated with it. If there is a dispute report associated, it is retrieved and output through a printer or other output device in hard copy form. Once in hard copy form the dispute report can be sent to the vendor. After the dispute report has been printed out, a query is made as to whether the amount to be paid is above a predetermined amount. As a precaution some companies, when paying bills, may require a certain level of authority to approve payment if it is greater than a predetermined amount. The output module provides notification to the system user that this sort of authorization is required. If authorization is given, a further query is made through the GUI as to whether their authorization for this payment amount has been received. If the authorization is received, an invoice is created for payment and this is output from the system in hard copy form. In the final step of the process, the electronic payment is transmitted to the vendor. This electronic payment may be either the full amount originally charged by the vendor or a short pay amount which had been determined through the dispute tracking module. In the case where there has been a dispute and the bill has been short paid, the vendor receives the dispute report which then can be further negotiated with the customer at a later time. Once this dispute report is resolved, as was described above, the dispute report then can be closed as was described above.

The foregoing description of the present invention has been presented for purposes of illustration and description. Furthermore, the description is not intended to limit the invention to the form disclosed herein. Consequently, variations and modifications commensurate with the above teaching, and the skill or knowledge of the relevant art, are within the scope of the present invention. The embodiments described hereinabove are further intended to explain best modes known for practicing the invention and to enable others skilled in the art to utilize the invention in such or other embodiments and with various modifications required

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by the particular applications or uses of the present invention. It is intended that the claims be construed to include alternative embodiments to the extent permitted by the prior art.

What is claimed is:

1. An apparatus for processing billed charges from at least one vendor, comprising:
 - a processor, comprising:
 - an upload module which automatically uploads the billed charges from the at least one vendor in a first format, wherein the billed charges include a plurality of entries with a billed rate component; and
 - a database which includes reference billing rate information; and
 - at least one graphical user interface in connection with the processor, wherein the graphical user interface is configured to receive the billed charges, wherein the at least one graphical user interface includes:
 - an automatic validation module which receives the billed charges and automatically compares the billed rate component of the plurality of entries with the reference billing rate information to identify discrepancies;
 - a dispute tracking module which generates at least one dispute file which may be associated with a particular one of the billed charges, where the graphical user interface provides for display of both the billed charges and the at least one dispute file which is storable in and retrievable from the database; and
 - a bill review and approval module which is operational in conjunction with a visual display which provides for selective accessing of and review of the billed charges and the associated at least one dispute file, and status changes relating to payment of the billed charges, where the graphical display is configured to receive input with regard to the billed charges, wherein the input includes at least one of: approve the billed charge and reject the billed charge.
2. The apparatus of claim 1, wherein the processor is a UNIX server.
3. The apparatus of claim 1 wherein the processor is connected to the at least one graphical user interface through a connection over a data network.
4. The apparatus of claim 3 wherein the connection is a ODBC TCP/IP connection.
5. The apparatus of claim 1 wherein the database is relational in nature.
6. The apparatus of claim 1 wherein the at least one graphical user interface is a computer workstation.
7. The apparatus of claim 1, further including at least one processing module from a group comprising:
 - a bill review and approval module which provides for review of the information relating to the billed charges, and status changes relating to payment of the billed charges.
8. The apparatus of claim 7 wherein the automatic validation module, the dispute tracking module, and the bill review and approval module are part of a software package loaded on the at least one graphical user interface.
9. The apparatus of claim 8 wherein automatic validation module is programmable through the user interface to include custom criteria for identifying the discrepancies.
10. The apparatus of claim 1 wherein the processor further comprises an output module which provides for automated

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payment to the at least one vendor for the billed charges which have been approved.

11. The apparatus of claim 10 wherein the output module is in connection with output means which provides invoices for the approved billed charges and dispute reports to the at least one vendor.

12. A system for processing billed charges from a vendor comprising:

- a processor which provides automated uploading of the billed charges, storage of the billed charges and reference information in a database, and outputting of payment information related to the billed charges;
- a user interface which includes means for automatically validating the billed charges with regards to the reference information, generating at least one dispute report related to the billed charges, associating the at least one dispute report with the billed charges and providing for storage of the dispute reports in the database, and providing for a visual review of the billed charges with respect to any of the associated dispute reports, as well as disposition of the billed charges in response to a received input through the user interface; and
- a data network which provides communication between the user interface and the processor.

13. The system of claim 12 wherein the processor includes an upload module which automatically uploads the billed charges from the vendor, converts the billed charges from a first format to a second format, checks integrity of the billed charges, scans the reference information for duplicates of the billed charges, and stores the converted billed charges in the database.

14. The system of claim 12 wherein the processor is a UNIX server.

15. The system of claim 12 wherein the user interface includes an automatic validation module which automatically retrieves the billed charges from the database and identifies discrepancies between the converted billed charges and the reference information.

16. The system of claim 12 wherein the automatic validation module is programmable through the user interface to include custom criteria for identifying the discrepancies in the billed charges.

17. The system of claim 16 wherein the custom criteria include at least one of: contracted rates, tariffs, and rates established by third parties.

18. The system of claim 12 wherein the user interface is a computer workstation.

19. The system of claim 12 wherein the invoices and the dispute reports are displayed on the user interface according to a hierarchical structure.

20. The system of claim 19 wherein information included in the invoices is transferable to the dispute reports by employing a drag and drop function.

21. The system of claim 12 wherein the processor further includes an output module which provides for automatic payment to the vendor of the billed charges which have been approved.

22. The system of claim 21 wherein the output module further includes means for automatically requesting approval when the billed charges are above a predetermined amount.

23. The system of claim 12 wherein the user interface provides functionality to perform at least one of: view the

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billed charges, view the dispute reports, selectively associate the invoices with the dispute report, search the invoices, search the dispute reports, search for vendor information, and search for account information.

24. The system of claim 23 wherein the functionality is provided through screen displays presented on the user interface.

25. The system of claim 1 wherein the billed charges relate to usage of telephone lines and the reference information relates to agreements between parties relating to use of the telephone line.

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26. The system of claim 25 wherein the reference information includes at least one of: circuit validity, circuit charges, tariffs.

27. The system of claim 11 wherein the billed charges relate to usage of telephone lines and the reference information relates to agreements between parties relating to use of the telephone line.

28. The system of claim 27 wherein the reference information includes at least one of: circuit validity, circuit charges, tariffs.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,144,726
DATED : November 7, 2000
INVENTOR(S) : Cross

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13,

Line 26, please delete the word "chargers" insert therefor--charges--;

Line 34, please delete the word "pavement" and insert therefor--payment--;

Line 35, please delete the word "fiber" and insert therefor--further--.

Signed and Sealed this

Twenty-sixth Day of June, 2001

Attest:

Nicholas P. Godici

Attesting Officer

NICHOLAS P. GODICI
Acting Director of the United States Patent and Trademark Office



US006047268A

United States Patent [19]**Bartoli et al.**[11] **Patent Number:** **6,047,268**[45] **Date of Patent:** **Apr. 4, 2000**

[54] **METHOD AND APPARATUS FOR BILLING FOR TRANSACTIONS CONDUCTED OVER THE INTERNET**

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[21] Appl. No.: **08/964,274**

[22] Filed: **Nov. 4, 1997**

[51] Int. Cl.⁷ **G06F 17/60**

[52] U.S. Cl. **705/35; 705/40; 713/153**

[58] Field of Search **705/35, 39, 40, 705/42, 44; 380/24; 235/379, 380**

[56] **References Cited**

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Assistant Examiner—Demetra R. Smith

[57] **ABSTRACT**

A method and apparatus for authenticating transactions accomplished over a data network utilizes a "cookie" containing both static information (user-identifying information) and dynamic information (transaction-based information). The transaction-oriented dynamic information portion comprises a random number and a sequence number, the latter tracking the number of billing transactions conducted by the user associated with the account number. The cookie, sent to the user's cookie file upon a previous transaction, is valid for only a single new transaction. A billing server, upon receiving the cookie containing the static and dynamic information portions, identifies the user from the account number in the static portion and accesses from an associated database the expected random number and sequence number that the billing server last sent to that user in the transaction-oriented dynamic portion. If the expected dynamic portion matches the received dynamic portion, the user is authenticated to proceed with the current transaction.

24 Claims, 3 Drawing Sheets

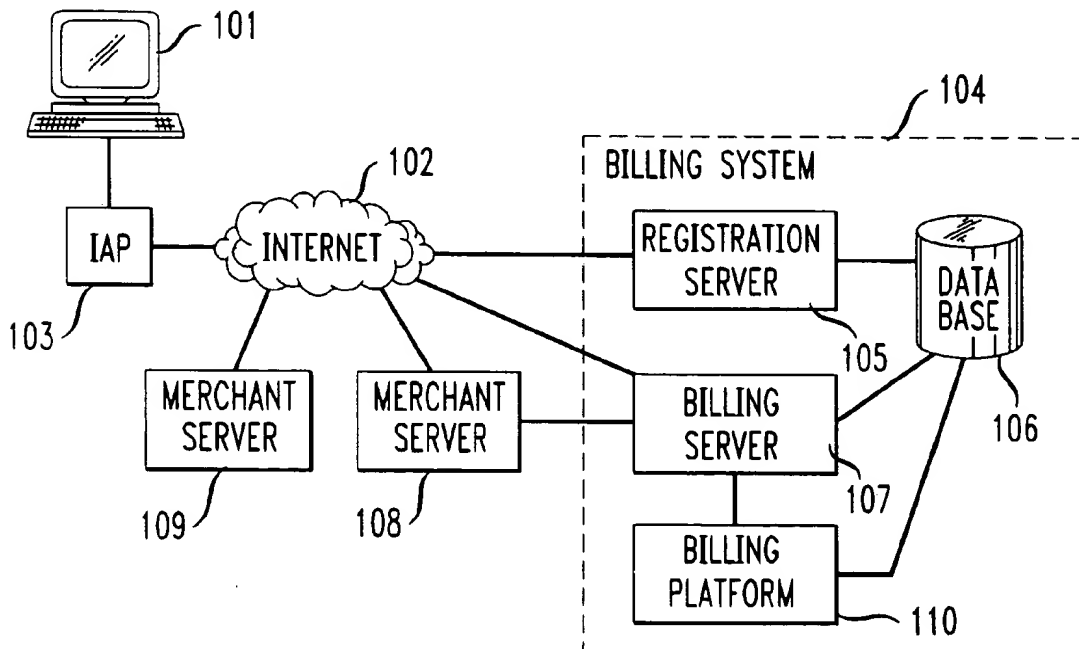
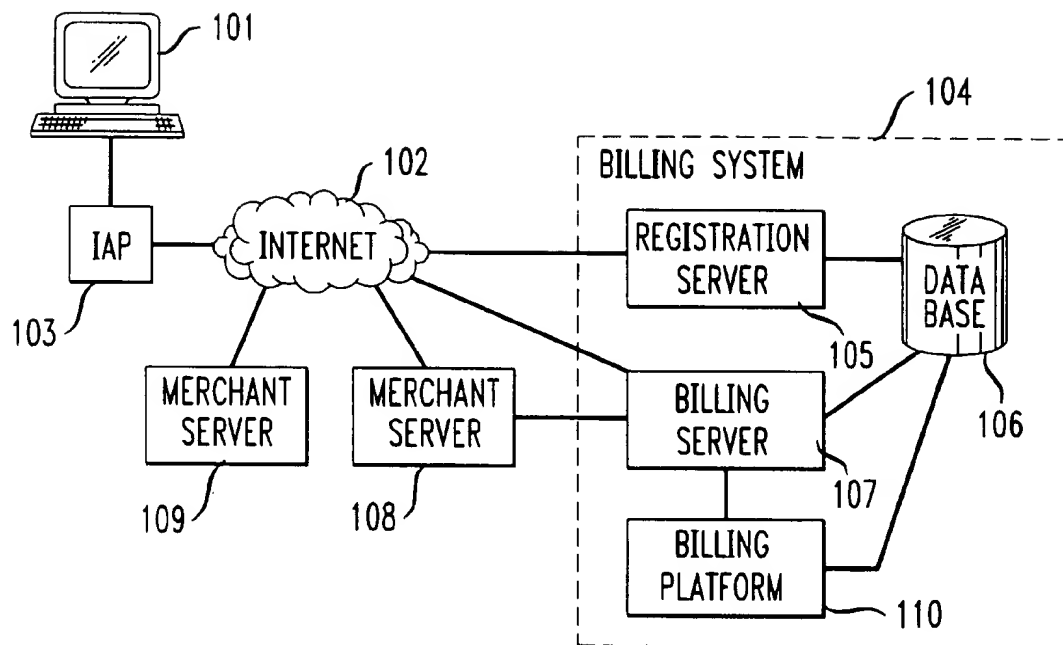
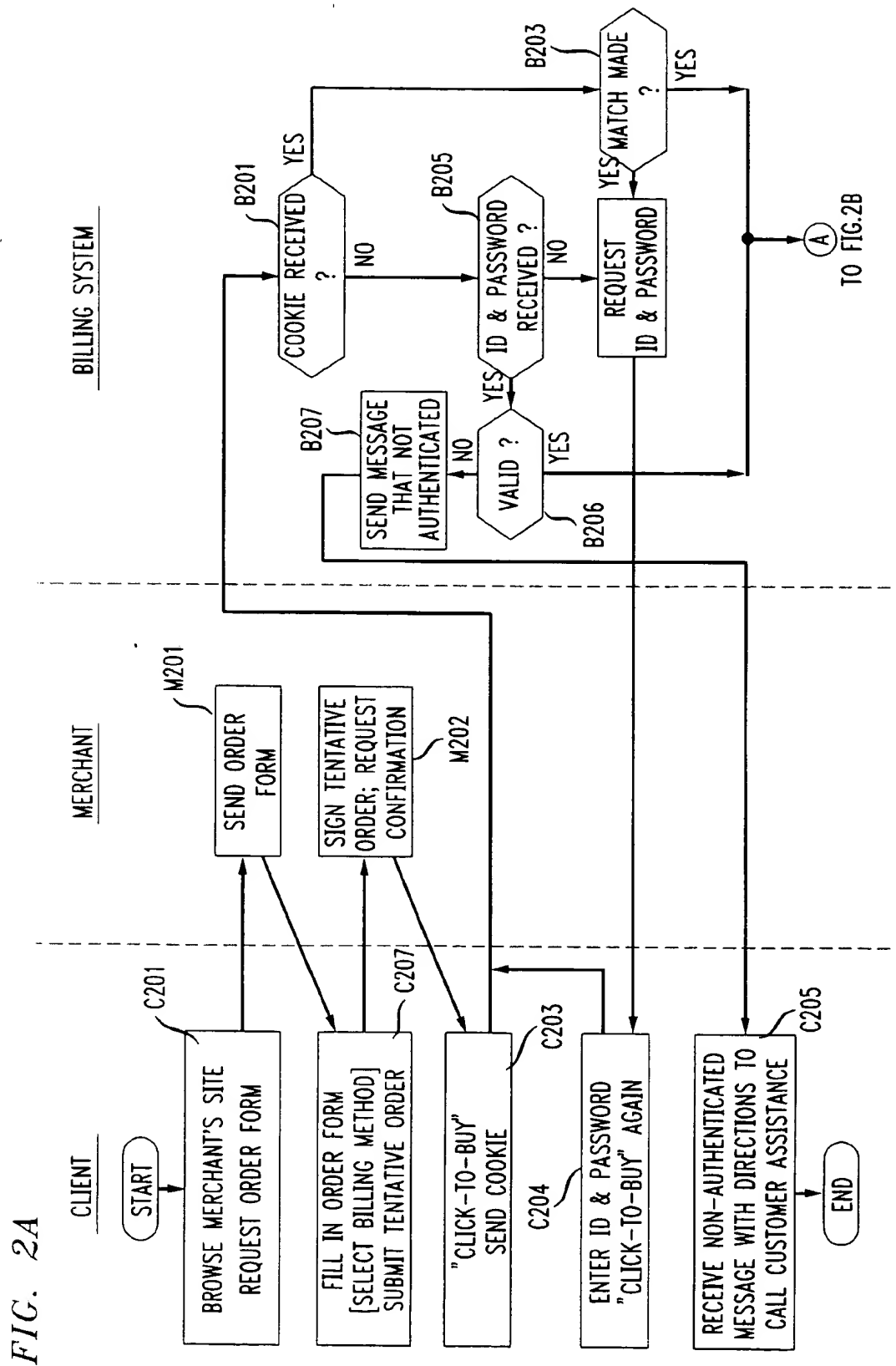
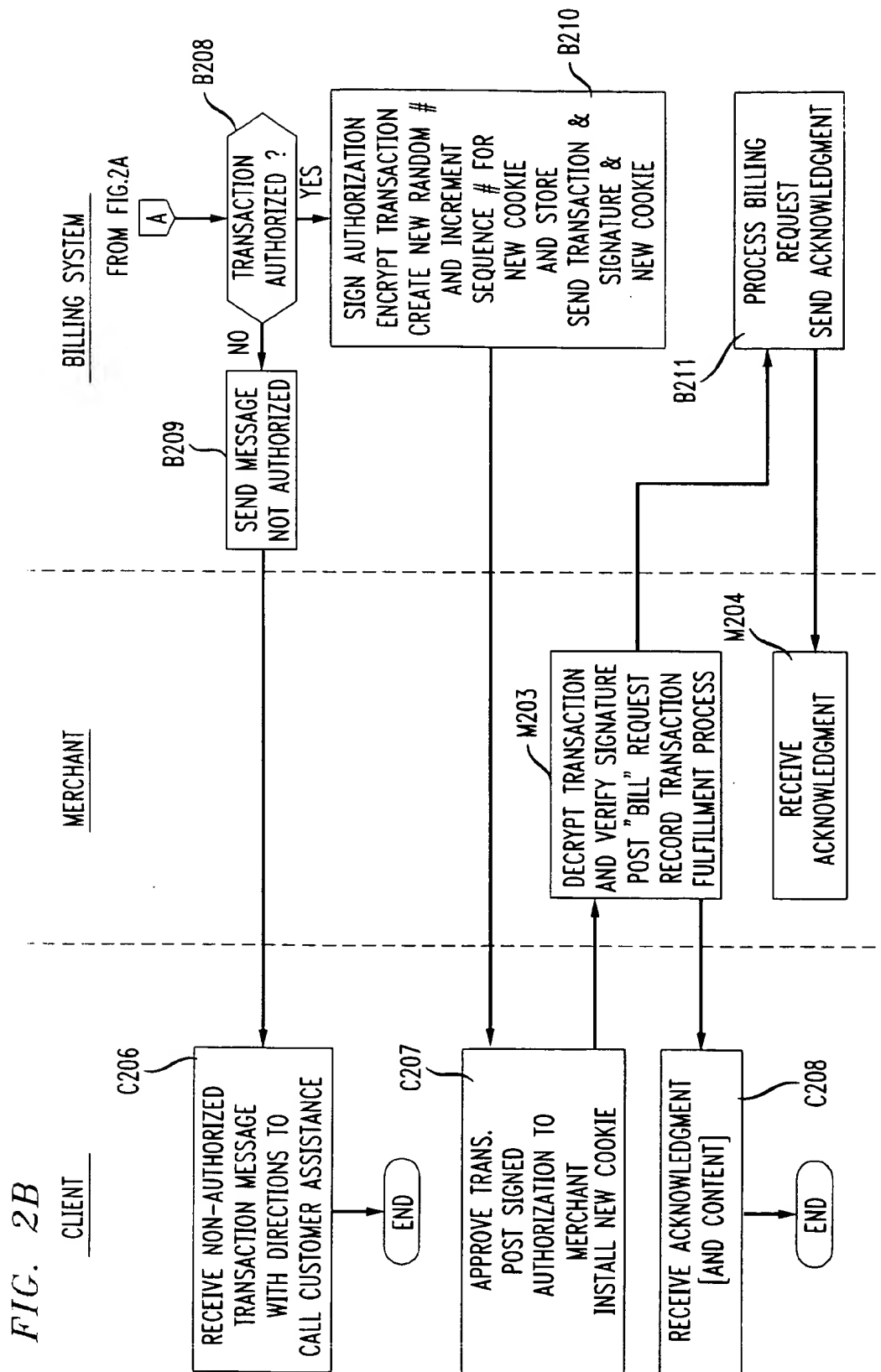


FIG. 1







METHOD AND APPARATUS FOR BILLING FOR TRANSACTIONS CONDUCTED OVER THE INTERNET

TECHNICAL FIELD

This invention relates to billing a user for transactions for services and/or goods provided and/or ordered over the Internet.

BACKGROUND OF THE INVENTION

On-line transactions between consumers and merchants on the World Wide Web (WWW) are becoming increasingly more numerous as the public becomes more facile in making purchases on the Internet. Such transactions can be for the purchase of "soft" goods, i.e., information, software and other material available in electronic form that can be delivered in real time to a user's client terminal. Such transactions can also be for the purchase of conventional "hard" goods, where the purchased merchandise are delivered off-line. Conventional on-line payment options generally involve the use of credit cards wherein the user provides his or her credit card number on-line or off-line to the merchant provider to pay for the "hard" or "soft" purchase to be delivered on-line or off-line.

Where the transactions involve a relatively small cost, for example \$10 or less, the credit card system of payment is too expensive. Further, the credit card payment system excludes potential customers who do not have a credit card, or those who do but do not "trust" either providing their credit card number on-line, or do not want to use their credit card for such purchases. It would be advantageous, therefore, that some trusted transaction intermediary perform the functions of authenticating a user on the WWW and authorizing the transaction. Once such a transaction intermediary authenticates the user and authorizes the transaction, the merchant is alerted to provide the goods or services which are the subject of the transaction and an account associated with the user is billed for the transaction amount. Advantageously, once the user has registered with the transaction intermediary, no sensitive billing information, such as a credit card number, needs to be sent to the merchant.

In co-pending application Ser. No. 08/532,336 filed Sep. 22, 1995 by Y. Ronen, co-inventor herein, and assigned to the same assignee as the present application, a method of billing for services and/or goods ordered over the Internet from a merchant is disclosed. As described therein, the customer/user places a real or a virtual telephone call to the merchant's 900 telephone number and is charged by the telephone company an amount for that call that is representative of the cost of the goods or services being ordered via the Internet from the merchant's server. The merchant's server associates the 900-number telephone call with the request via the Internet for the goods or services in order to authenticate and authorize the transaction. In co-pending patent application Ser. No. 08/636,109 filed Apr. 22, 1996, co-invented by the same Mr. Ronen who is co-inventor herein, and assigned to the same assignee as the present application, a method of billing for transactions conducted over the Internet is disclosed in which a billing server connected on the Internet receives the IP address assigned to that user's client for the current user session and an indication of the user's identity from the user/customer's Internet Access Provider (IAP). In response to a chargeable transaction, the merchant's server transmits to a billing platform the IP address identity of the user making the transaction and the cost associated with the transaction. The

billing server then cross-references the IP address associated with the cost of the transaction received from the merchant's server with the IP-address/user-identity relationship received from the IAP to properly charge an established account of the user for the transaction. Such an account is established by the user prior to the execution of the transaction for billing in a predetermined manner to, for example, the user's selected credit card, the user's debit card, the user's telephone account associated with his or her phone number, the user's merchant credit card, or other billing mechanism. For this billing methodology, arrangements thus need be established between billing server and the large number of different Internet Access Providers that provide Internet access to a tremendously large customer base since for each user's session the IAP must be programmed to forward to the appropriate billing server the relationship between the user's currently assigned IP address and identity.

A billing methodology that minimizes the steps that need be performed to obtain authorization and approval for an Internet transaction is therefore desirable. Further, a billing methodology that requires interactions between only the user, the merchant, and the provider of the billing service is advantageous.

SUMMARY OF THE INVENTION

A subscribing user who has registered with the provider of the billing system of the present invention may browse the home page of a merchant which has itself made previous arrangements with the provider of the billing system. While "visiting" the merchant's site, which has also registered with the billing system, the subscribing user is offered the option to purchase some good or service at a stated price for either on-line or off-line delivery. In response to the user's intent to purchase the selected item and be billed via the billing system, the merchant's digitally signed order is sent to the billing system for authentication and authorization of the transaction. Specifically, in accordance with the present invention, information previously provided to the user's client terminal's cookie file is transmitted to a billing server within the billing system. This information comprises a static information portion and a transaction oriented dynamic information portion, which are encrypted prior to transmission. The static information portion identifies the user through an assigned account number. The transaction oriented dynamic information portion comprises at least one sequence that was sent to the user's cookie file by the billing server upon a previous transaction, and is valid for only a single new transaction. The billing server, upon receiving from the user's browser program the cookie containing the encrypted static and dynamic information portions and decrypting same, identifies the user from the static portion, and accesses from an associated database the expected transaction oriented dynamic portion that the billing server last sent to that user. If the expected dynamic portion matches the received dynamic portion, the user is authenticated to proceed with the current transaction. The billing server, upon authentication of the user, then authorizes the specific transaction based on various criteria such as the user's credit limit, the cost of the transaction, etc. The billing server then sends to the user's browser a new cookie which contains the user's account identity in the static information portion and a new transaction oriented dynamic portion to be used by the user's browser for authentication of the user for a next transaction. Upon receipt, the user's browser program installs the new cookie and provides the user the opportunity to reject or finally approve of the transaction. If approved by

the user, the order is sent to the merchant's server via the user's client terminal browser program. Upon receipt, the merchant's server posts the complete transaction information to the billing server for billing and provides for the delivery of the goods or services to the user. The customer's transaction is then confirmed through an acknowledgment sent via e-mail transmitted to the e-mail address associated with the account number. The billing server either after each transaction, or on a periodic basis, sends the transaction summary to a billing platform for billing of the user based on his or her registered billing preference such as a telephone bill, credit card charge, or a direct invoice. The billing platform then settles with the merchant after a fixed number of days, contingent on the user paying his or her bill.

In the specific embodiment of the present invention, the transaction oriented dynamic information portion of the cookie comprises a random number and a sequence number that are both assigned by the billing server. After each transaction, a random number is created by the billing server and sent back to the user's client terminal for use for the next transaction together with a sequence number that tracks the number of separate billing transactions conducted by the user associated with the static account number. The latter is incremented by one after each transaction. Both the random number and the sequence number are stored in a database associated with the billing server in a record associated with the user's account. As noted, the cookie is valid for only a single transaction. If a user's cookie file should be misappropriated from the user's client terminal or is intercepted during transmission from the billing server to the client terminal and is fraudulently used, a subsequent use by the actual registered user will cause the billing server to reject the user's cookie. The billing server will then request an ID and a password from the user for user authentication. By comparing the sequence number of the cookie received from the actual user with the sequence in the cookie stored in the billing server, a determination of which transactions are fraudulent made can be made. A new cookie containing a new random number is then placed by the billing server in the user's cookie file, thereby precluding further fraudulent use by the misappropriating cookie thief.

Advantageously, the authentication of a user making a transaction in accordance with the present invention does not require installation of any special software on the user's client terminal other than a browser which supports cookie files. Furthermore, the user can be automatically identified by the billing system with the cookie without requiring the user to enter an ID or password for every transaction. Even furthermore, the user is able to retain his or her anonymity with respect to the merchant, which a user may be desirous of doing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a system showing a billing system connected to the Internet for billing for transactions conducted by a user's client terminal with a merchant WWW server in accordance with the present invention; and

FIGS. 2A and 2B, referred to collectively hereinafter as FIG. 2, show the steps of a transaction flow involving the client terminal, the merchant server and the billing system in accordance with the present invention.

DETAILED DESCRIPTION

With reference to FIG. 1, a user at a client terminal **101** is connected to the Internet **102** through an Internet Access Provider **103**. The connection between the client terminal

101 can be, for example, through a Local Exchange Carrier (LEC) (not shown), through a cable TV network (not shown), or through another access medium. The client terminal **101** could also be connected directly to a Local Area Network which is directly connected to the Internet **102**. The client terminal **101** runs a browser program which enables the user to "surf the Net" to visit various sites connected to the Internet. Some of these sites only provide information content and other sites may provide information in conjunction with offers of services and/or "soft" or "hard" goods with an associated cost. The services for a fee may include the delivery to the user of information itself, or the delivery of "soft" goods that can be delivered digitally on-line over the Internet to the client terminal, such as software, music, video, etc. If the user orders "hard" goods over the Internet, as for example clothing, delivery need obviously be made off-line. Some of these transactions that involve the delivery of information or a software program may have a relatively low cost to associated with them. Further, a user may visit such an on-line merchant's site only once or very infrequently. The present invention eliminates the need for the user to establish a financial relationship with the on-line merchant who is supplying the soft or hard goods that are the subject of the transaction. Thus, the user need not provide any financial information, such as a credit card or other personal information to the merchant to be assured initiation of the delivery process for the desired soft or hard goods or services. Accordingly, a user who has registered with the billing system **104** of the present invention and who enters into an on-line transaction with a registered merchant can obtain the transacted-for hard or soft goods or services without having to provide any personal information to the merchant, including his or her identity. The merchant, having registered itself with the billing system, can also be assured of receiving payment from the trusted provider of the billing system since it knows that each transaction will be user-authenticated and authorized by the billing system.

In order to conduct on-line transaction through the billing system **104**, the user needs to register with the system. This registration occurs at the user's initiative, by posting information via the Internet to a registration server **105** within billing system **104** or by paper (e.g., fax or mail), or by telephone. The registration process occurs once per user. The process allows a user to establish an account, which requires a billing name, address, e-mail address, and billing preferences for charges made to the account. The latter may include a direct bill to an email address or to the postal address associated with the user's telephone number, or to a telephone bill (LEC or Interchange carrier), or to a user's credit card or debit card. These preferences can be distributed amongst different billing mechanisms as a function of the type of transaction being billed. Thus, the user can direct that all transactions of less than a predetermined cost be billed to his or her telephone bill, and those of greater than that cost be billed to his or her credit card. Also, the user can direct transactions of a certain type, such as purchases of software to be direct-billed and other types be billed according to the cost of the goods as noted above. Other information unique to the user, such as a password, is also obtained in the registration process that can be later used to validate the billing information. The information can be updated when the user's billing information changes, or additional users need to added/removed from an specific account. If entered on-line through registration server **105**, the information is stored in a database **106** for later retrieval. If received from the user by another methodology, the information is entered by an operator associated with the billing system **104** and stored in database **106**.

Upon activation of the account, the billing server assigns and deposits a cookie on the browser program running on user's client terminal 101, which in turn transmits it back to the billing system 104 during the course of a transaction. Cookies are well known in the art. Cookies are described, for example, in Netscape Support Documentation found on the Internet at http://home.netscape.com/newsref/std/cookie_spec.html. The cookie is sent to the client by including a Set-Cookie header as part of an HTTP response. The Set-Cookie is sent by the billing server 107 and is generated by a CGI script in the following format:

```
Set-Cookie: NAME=VALUE [;expires=DATE][;path=PATH]
```

```
[;domain=DOMAIN_NAME][;secure]
```

The cookie is stored in a text file (e.g., Netscape cookie.txt file) on the client terminal 101 and is sent to the originating billing server 107 to its domain when the client terminal makes a request to DOMAIN_NAME, specifically the URL associated with the billing server 107. Although the Netscape browser uses one data file for all cookies, with one line being used per cookie in the file, other browser such as MS Internet Explorer, use a separate data file for each cookie. For either, the cookie remains valid until its expiration on DATE. In accordance with the present invention, the cookie VALUE is an encrypted string that comprises in its decrypted form a static information portion and a dynamic information portion. The static portion is an alphanumeric string identifying the user's account number as it is stored in database 106. The dynamic portion includes a random number generated by the billing server and a sequence number that is stored in database 106 in association with the user's account number. That sequence number is initialized at one (or any other value) when the user first registers with the billing platform and is subsequently incremented by one (or any other positive or negative predetermined number or algorithm) each time the user makes a separate transaction. The cookie thus initially deposited by the billing server 107 into the user's cookie file in its decrypted form thus contains a string comprising the user's account number, a random number generated by the billing server 107, and a sequence number having a value of one. The billing server stores the generated random number and the sequence number in database 106 in a record associated with the user's account number that has been created.

As the user on client terminal 101 subsequently "surfs the Net", he or she will link to the home page of various merchants' servers 108 and 109. When linking to the home page of a particular merchant's server 108 which has entered into a billing agreement with the provider of the billing system 104, the user is offered the option to purchase some item at a stated price using the payment option provided by the subscribed-to billing system 104. When the user clicks on an order page, representing the intent to purchase the selected item and to be billed through the billing system 104 via his or her account established therein, the merchant's signed order is sent to billing system 104 for authentication of the user and authorization for the transaction. At the same time the information stored in the cookie file on the user's client terminal is transmitted to billing server 107.

The user is then authenticated by the billing system 104 using the information in the received cookie. Specifically, the received cookie is decrypted and the VALUE of the decrypted cookie received by the billing server is parsed into the static user account identity portion and the dynamic random number and sequence number portions. The identity of the requesting user is determined from the account ID in the static information portion of the VALUE string. The

random number and the sequence number in the dynamic information portion are then compared with the random number and the sequence number stored in database 106 for the record associated with the determined account number. If a match is made, the user is authenticated for the transaction.

There may be cases when the cookie cannot be used. The cookie may have been expired, or a cookie file in a user's browser program may have been erased, or the browser program may have disallowed the writing into a cookie file. Also, there may be other legitimate reasons in which there is not a match between the cookie sent from the user's client terminal to the billing server and the cookie stored in the database 106 for that user. The latter could arise when the user uses another browser to make an on-line billing system-billed purchase from a client terminal other than the one in which the cookie was originally deposited. In any such cases in which a cookie match cannot be made, the user is prompted for a login name and a password, which are chosen by the user during the registration process. If the billing system detects that the cookie information is incorrect, but the user has correctly provided the login name and password, the billing system will deposit a cookie on the user's browser. However, to ensure that the user is aware that a cookie is being deposited, and that it can provide automatic authentication for a subsequent billing system-based purchase from that browser on that client terminal, the billing system posts a message to the client terminal requesting the user to affirmatively acknowledge, through an interactive click, that they wish to save their billing system account information on that client terminal for subsequent transactions.

There may also be situations in which the user may find it desirable to and force the entry of an ID and a password for each transaction to provide added security. Such a situation may arise when multiple users share a common client terminal, as in a household. Thus, by providing the user with the option to disable the cookie, the user will be forced to enter an ID and a password for transaction authentication.

If the cookie provided to the billing system from the user's client terminal does not match the cookie stored in the database 106 for the requesting user, a possibility exists that a fraudulent use of the user's account has been made by someone who has misappropriated the user's cookie from either the client terminal's cookie file, or through on-line eavesdropping of the transmission of the cookie to the client terminal. If the cookie has been stolen and used to make a fraudulent transaction, the thief may have been able to make successive such transactions by receiving a new cookie after each transaction that would enable a next transaction to be made. Each such fraudulent transaction will generate a new cookie with a new random number and an incremented sequence number. When the legitimate user attempts to later make a transaction, the cookie then stored in his or her client terminal's browser program will no longer match the cookie stored in database 106 for that client. The user will thus be initially rejected but will be authenticated through the input of a valid account number and password. By comparing the sequence number of the cookie then stored in database 106 for that user's account with the sequence number of the cookie in the cookie file stored in the user's client terminal, the identity and the number of fraudulent transactions can be determined. Thus, for example, if the sequence number of the user's cookie is 27 and the sequence number in the cookie stored in database 106 for that user's account is 30, then the last three transactions were fraudulently made to the

user's account assuming that each transaction increments the sequence number by one. Once such a fraud has been detected, a new cookie is deposited in the user's cookie file, thereby precluding further use by the thief of the misappropriated cookie or its successively generated cookies.

Assuming that the user has been authenticated, the transaction needs to be authorized by the billing system. When the user "clicks-to-buy", which is the stage in the merchant-user electronic shopping web interface when the user has confirmed a willingness to complete the transaction with the stated terms, the transaction must be authorized. The order information, digitally signed by the merchant is sent through the user's client terminal's browser to the billing system 104. The order amount, combined with the cookie file containing the user's account ID number and transaction number, provide sufficient information to query the user's profile stored in database 106 to verify if the transaction should be authorized. Authorization for the transaction will be granted if (1) the user is registered as active in the billing system; (2) the merchant is registered with the billing system; (3) the user is not blocked from making purchases based on payment history; (4) the purchase amount does not exceed a per-transaction limit specified by the user upon registration; (5) the purchase amount does not exceed the billing system's specified cumulative credit limit; and (6) the purchase does not violate any customer-specified restrictions (e.g., block transactions during certain times) or preferences (e.g., block transactions for certain types of merchandise). If authorization is denied, a message is displayed on the user's browser indicating that the purchase cannot be authorized and inviting the user to contact a customer assistance representative at a specified phone number. Additional criteria can also be used to determine whether or not to authorize a specific transaction.

After the user has been authenticated and the transaction authorized, an authorization token, which is the digital signature of the order created by the billing system 104 using its private key, along with the order form encrypted using the merchant's public key, is generated by the billing system and sent to the user's browser together with a summary of the order and the charges for final approval by the user of the charges. The user can retain the authorization token for later proof of the order and charges. Also sent to the user's browser by the billing server 107 is a new cookie having a VALUE field containing the static user's account ID information portion and a dynamic information portion comprising a newly created random number and an incremented sequence number. This new cookie is for use by the user's browser program for a next transaction.

Following the user's final approval of the charges, which may occur by the failure of the user to affirmatively cancel the order, the token and the order are sent to the merchant's server 108 via the user's client terminal's browser. Receipt of the authorization token verifies to the merchant that the transaction has been authorized by the billing system. Software running on the merchant server 108 verifies the authorization and delivers the requested goods to the user. This may happen in real time for "soft" goods. For "hard" goods, the merchant provides an acknowledgment to the user that the ordered merchandise is being shipped or the order has been processed. For "soft" goods, the merchant's server 108 posts the complete transaction information (i.e., authorization token, order information) to the billing system 104 for billing by a billing platform 110. For "hard" goods, certain state and federal regulations may require that for some types of merchandise the transaction cannot be posted until the goods are shipped, while others (e.g., catalog sale of goods)

are permitted to post after the order is accepted. The billing server 107 sends the transaction information, appropriately formatted to the billing platform 110 for billing the user based on the user's billing preferences as stored in database 106. Upon payment of the bill by the user, the billing system settles with the merchant.

At the end of the user's Internet session, or periodically if there is any activity related to the user's account, the billing system transmits an email summary to the account holder showing all the transactions conducted over a period of time. The information provided shows the transaction ID, the amount, date/time of purchase and merchant name.

With reference to FIG. 2, the interactive steps are shown between a user at a client terminal browsing on the Internet and making an on-line purchase, the merchant server with which the transaction is made, and the billing system of the present invention which automatically authenticates the user, authorizes the transaction, and bills for the purchase. At step C201 the user browses the merchant's site and requests an order form for ordering some good from the merchant. At step M201, the merchant's server responds by sending the requested order form to the client terminal. At step C202, at the client terminal the user fills in the order form, optionally may select a billing method, and submits the tentative order back to the merchant. The merchant then must verify the order (availability, pricing, etc.) and calculate a final price. The merchant at this stage does not have a valid transaction number from the billing system, nor the user's account ID on the billing system. At step M202 the merchant constructs a message consisting of: a merchant ID, a time-stamp, an optional merchant transaction ID or order number, a transaction amount, and optional other order data such as type of request and expiration date for an offer. The message is hashed into a digest and signed by the merchant's private key. The message data, signature, and merchant's certificate are wrapped and encrypted and returned to the client with a request for confirmation of the order. At step C203, the user confirms the order by a "click-to-buy" input for which an icon is provided on the HTML page returned to the client and which provides a link to the billing system. When the user clicks on this icon, the request for authorization is routed to the billing system over a Secure Socket Layer (SSL) link, in which the merchant's signed order is embedded. In addition, the cookie stored in the user's cookie file on the browser program is sent to the billing system as well. The billing system, upon receiving the cookie and the order information will first authenticate the user. At step B201, a determination is made whether a cookie is received. If a cookie is not received, the process proceeds to step B205 where a determination of whether a user ID and a password have been received. If yes, at step B206 a determination of whether that ID and password are valid is made. If not, at step B207, a message is sent back to the client terminal to inform the user at step C205 that they have not been authenticated and to call a customer assistance number. If a valid ID and password are found at step B206, the process passes to step B208 where transaction authorization will take place. If neither a cookie is received at step B201, nor an ID and a password are received at step B205, then the billing system sends a request back, at step 203, to the client requesting an ID and a password. Similarly, if a cookie is received at step 201, at step B202, the received cookie is compared with the cookie stored in the billing system for the user identified from the static information portion of the cookie. If a match is made, the user is authenticated and the process passes to step B208 for transaction authorization. If a match is not made at step B202, then the process passes to

step B203, where the billing system issues a message requesting an ID and a password from the user. In response to the request for a user ID and password from step B203, generated in response to either steps B205 of B202, at step C204 the user enters his or her ID and password and enters a "click-to-buy" input again. If a valid password and ID are returned, the process passes through steps B201, B205, and B206 for authorization at step B208. If a valid password and ID are not returned, then the process passes through steps B201, B205, B206 and B207 to send a message of non-authentication to the user attempting to make the transaction.

At step B208, a determination is made whether the transaction is authorized. To do this, the encrypted message containing the original order, the merchant's signature and the certificate are decrypted. The billing system then determines whether the transaction can be authorized. As previously noted, a transaction is authorized if the user is registered in the billing system database, the merchant is registered with the billing system, the user is not blocked from making purchases based on payment history, the purchase amount does not exceed a per-user specified limit, and the purchase does not violate any customer-specified restrictions or preferences. If the transaction is not authorized, at step B209, a message is returned to the merchant through the user's browser indicating that the transaction was unable to be authorized. At step C206, the user receives the message with directions to call a specified customer assistance number for further information.

If the transaction is authorized at step B208, at step B210 an authorization response is prepared for transmission to the user for final approval of the transaction and then for forwarding, upon such approval to the merchant. The billing system adds a transaction ID, an authorization time-stamp, an authorization code, and an authorized transaction amount, together referred to as the authorized transaction data. The authorized transaction data, the billing system signature and certificate are then encrypted. In addition, a new random number is created and the sequence number is incremented to create a new cookie, which is sent back to the user with the encrypted transaction and signature over a SSL link. At step 207, the user is asked to accept the charges requested by the merchant. If accepted, the encrypted signed transaction data is sent to the merchant. The new cookie is also installed in the user's browser program. At step M203, the transaction data is decrypted and the signature verified. The transaction is then fulfilled either by the real-time on-line delivery of the goods or initiating processing for off-line delivery of the ordered merchandise. The transaction is recorded by the merchant and a bill request is posted to the billing system. At step C208, the user receives an acknowledgment that the order has been received and the content of the order, if the latter is delivered on-line. At step B211, the billing server processes the billing request, billing the user in accordance with the registered billing preference and sends an acknowledgment to the merchant that the user has been billed. At step M204, the merchant receives that acknowledgment and later receives payment from the billing system for the goods provided to the user.

Although described above in conjunction with the delivery to the user of goods after billing has been effected, the present invention could equally apply to a scenario in which the goods are delivered to the user on-line before payment is made, such as for shareware. In this scenario, the merchant first downloads the goods to the user and then offers the user to pay with the direct billing payment option of the present invention. Alternatively, the user can be authorized to make purchases for a specific dollar amount, before any items are selected for purchase, and the customer is then allowed to browse and choose items for purchase up to the

authorized amount. After the user has selected all items, the actual dollar amount spent, which is less than or equal to the authorized amount, is posted to the billing system.

Although described in conjunction with the authentication of a user for a transaction for the delivery of goods that is being conducted on the Internet, the principles of the present invention could be applied to the authentication of a user for any type of transaction that is being conducted over any type of data network.

The above-described embodiments are illustrative of the principles of the present invention. Other embodiments could be devised by those skilled in the art without departing from the spirit and scope of the present invention.

The invention claimed is:

1. A method of authenticating a user for a transaction on a data network comprising:

sending to a user's client terminal data containing a static information portion and a transaction-oriented dynamic portion, the static information portion identifying an account associated with the user and the transaction-oriented dynamic information portion containing information generated for that user that is valid for a single subsequent transaction;

storing the transaction-oriented dynamic information portion in association with the static information portion;

receiving, from the user's client terminal, the data containing the static information portion and the transaction-oriented dynamic information portion in association with information relating to the single subsequent transaction;

identifying the user's account from the received static information portion;

comparing the transaction-oriented dynamic information portion received from the user's client terminal with the transaction-oriented dynamic information portion stored in association with the static information portion; and

authenticating the user for the single subsequent transaction if the received transaction-oriented dynamic information portion matches the stored transaction-oriented dynamic information for the account associated with the user.

2. The method of claim 1 further comprising:

creating a new transaction-oriented dynamic information portion;

sending to the user's client terminal new data to replace the previously sent data, the new data containing the same static information portion in the previously sent data and the new transaction-oriented dynamic information portion, the new transaction-oriented dynamic information portion being different than the transaction-oriented dynamic information portion in the previously sent data, the new data being valid for authenticating the user for a next single transaction; and

storing the new transaction-oriented dynamic information portion in association with the same static information portion.

3. The method of claim 2 wherein the transaction-oriented dynamic portion of the data previously sent to the user's client terminal and the new transaction-oriented dynamic information portion each comprise a random number and a sequence number.

4. The method of claim 3 wherein the new transaction-oriented dynamic portion comprises a random number different than the random number in the data previously sent to the user's client terminal and a sequence number that is equal to the sequence number in the data previously sent to the user's client terminal plus a predetermined increment.

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5. The method of claim 1 wherein the data network is the Internet.

6. The method of claim 5 wherein the data is contained within a cookie.

7. The method of claim 1 wherein the static information portion and the transaction-oriented dynamic information portion of the data are encrypted.

8. A method for authenticating a user for a transaction on the Internet comprising:

sending to a user's client terminal a cookie containing a static information portion and a transaction-oriented dynamic portion, the static information portion identifying an account number associated with the user and the transaction-oriented dynamic information portion containing information generated for that user that is valid for a single subsequent transaction;

storing the transaction-oriented dynamic information portion in association with the user's account number identified by the static information portion;

receiving from the user's client terminal the cookie containing the static information portion and the transaction-oriented dynamic information portion in association with information relating to the single subsequent transaction;

identifying the user's account number from the static information portion in the received cookie; and

comparing the transaction-oriented dynamic information portion in the received cookie with the stored transaction-oriented dynamic information portion associated with the identified user's account number.

9. The method of claim 8 further comprising authenticating the user for the transaction if the transaction-oriented dynamic information portion in the received cookie matches the stored transaction-oriented dynamic information portion.

10. The method of claim 8 further comprising:

if the transaction-oriented dynamic information portion in the received cookie does not match the stored transaction-oriented dynamic information portion, requesting an account number and a password from the user

receiving the account number and password from the user in response to the request; and

if the received password matches a stored password associated with the user's account number, authenticating the user for the transaction.

11. The method of claim 9 further comprising:

creating a new cookie with a new transaction-oriented dynamic information portion and the same static information portion in the cookie previously sent to the user;

sending the new cookie to the user's client terminal to replace the previously sent cookie; and

storing the new transaction-oriented dynamic information portion in association with the user's account number.

12. The method of claim 8 wherein the transaction-oriented dynamic information portion of the cookie comprises a random number and a sequence number.

13. The method of claim 12 wherein the sequence number in the transaction-oriented dynamic information portion of the new cookie is equal to the sequence number in the cookie previously sent to the user's client terminal plus a predetermined increment.

14. The method of claim 8 wherein the transaction-oriented dynamic information portion and the static information portion of the cookie are encrypted.

15. The method of claim 10 further comprising:

if the received password does not match a stored password associated with the user's account number, denying the transaction.

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16. The method of claim 8 further comprising:

if the transaction-oriented dynamic information portion in the transaction-oriented received cookie does not match the stored transaction-oriented dynamic information portion, denying the transaction.

17. The method of claim 13 further comprising:

if the transaction-oriented dynamic information portion in the received cookie does not match the stored transaction-oriented dynamic information portion, determining whether any fraudulent transactions were made on the user's account.

18. The method of claim 17 wherein the step of determining whether any fraudulent transaction were made comprises:

comparing the sequence number in the cookie received from the user's client terminal with the sequence number in the stored cookie; and

identifying fraudulent transactions from the difference between the sequence number in the cookie received from the user's client terminal and the sequence number in the stored cookie.

19. A system for authenticating a user for a transaction on the Internet comprising:

means for sending to a user's client terminal a cookie containing a static information portion and a transaction-oriented dynamic information portion, the static information portion identifying an account number associated with the user and the transaction-oriented dynamic information portion containing information generated for that user that is valid for a single subsequent transaction;

means for storing the transaction-oriented dynamic information portion in association with the user's account number identified by the static information portion;

means for receiving from the user's client terminal the cookie containing the static information portion and the transaction-oriented dynamic information portion in association with information relating to the single subsequent transaction;

means for identifying the user's account number from the static information portion in the received cookie; and

means for comparing the transaction-oriented dynamic information portion in the received cookie with the stored transaction-oriented dynamic information portion associated with the identified user's account number.

20. The system of claim 19 wherein the user is authenticated for the transaction if the transaction-oriented dynamic information portion in the received cookie matches the stored transaction-oriented dynamic information portion.

21. The system of claim 20 wherein the transaction-oriented dynamic information portion of the cookie comprises a random number and a sequence number.

22. The system of claim 21 wherein the sequence number in the transaction-oriented dynamic information portion of the new cookie is equal to the sequence number in the cookie previously sent to the user's client terminal plus a predetermined increment.

23. The system of claim 21 wherein the transaction-oriented dynamic information portion and the static information portion of the cookie are encrypted.

24. The system of claim 19 wherein the transaction is denied if the transaction-oriented dynamic information portion in the received cookie does not match the stored transaction-oriented dynamic information portion.

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US005774879A

United States Patent [19][11] **Patent Number:** **5,774,879****Custy et al.**[45] **Date of Patent:** **Jun. 30, 1998**[54] **AUTOMATED FINANCIAL INSTRUMENT
PROCESSING SYSTEM****OTHER PUBLICATIONS**[75] Inventors: **Jeanne M. Custy; Benjamin L. Knoll**,
both of Denver; **Shunsaku Suguira**,
Golden; **Brian W. Walsh**, Northglenn,
all of Colo.[73] Assignee: **First Data Corporation**, Omaha, Nebr.[21] Appl. No.: **732,159**[22] Filed: **Oct. 16, 1996****Related U.S. Application Data**

[63] Continuation of Ser. No. 173,907, Dec. 27, 1993, abandoned.

[51] **Int. Cl.⁶** **G06F 157/00**[52] **U.S. Cl.** **705/35; 395/110; 395/188.01**[58] **Field of Search** **395/235, 218,**
395/110, 117, 491, 186, 188.01; 340/825.3,
825.31, 825.34; 235/379-383; 283/57; 364/918.2[56] **References Cited**

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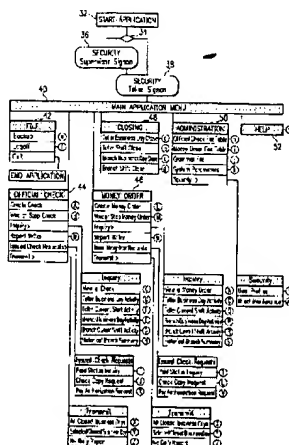
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Primary Examiner—Gail O. Hayes**Assistant Examiner**—Frantzy Poinvil**Attorney, Agent, or Firm**—Sidley & Austin[57] **ABSTRACT**

An integrated data processing system is described which comprises an execution control processor (10) that itself comprises a security processor (12) and data base processor (14). Bidirectional communication with a printer (30) is provided through a print processor (28) to provide for the secure printing of financial instruments. Grammar files (24) and parameter files (26) are supplied to allow for the configuration and customization of the execution control processor (10) and a graphical user interface (18). A communications processor (20) is provided to establish network connection with a host computer. Context-sensitive help is provided using a help processor (22).

19 Claims, 8 Drawing Sheets

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FIG. 1

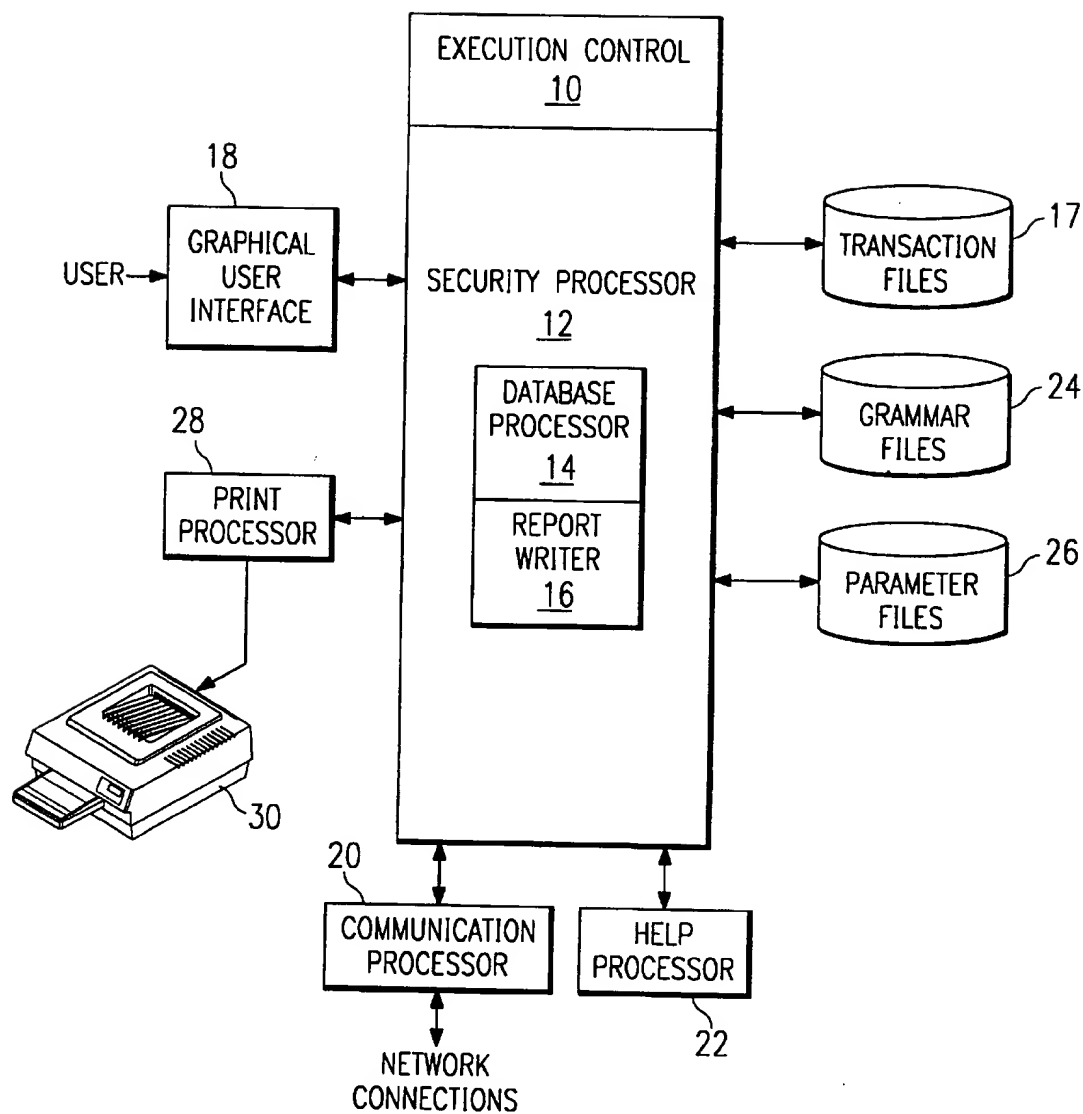
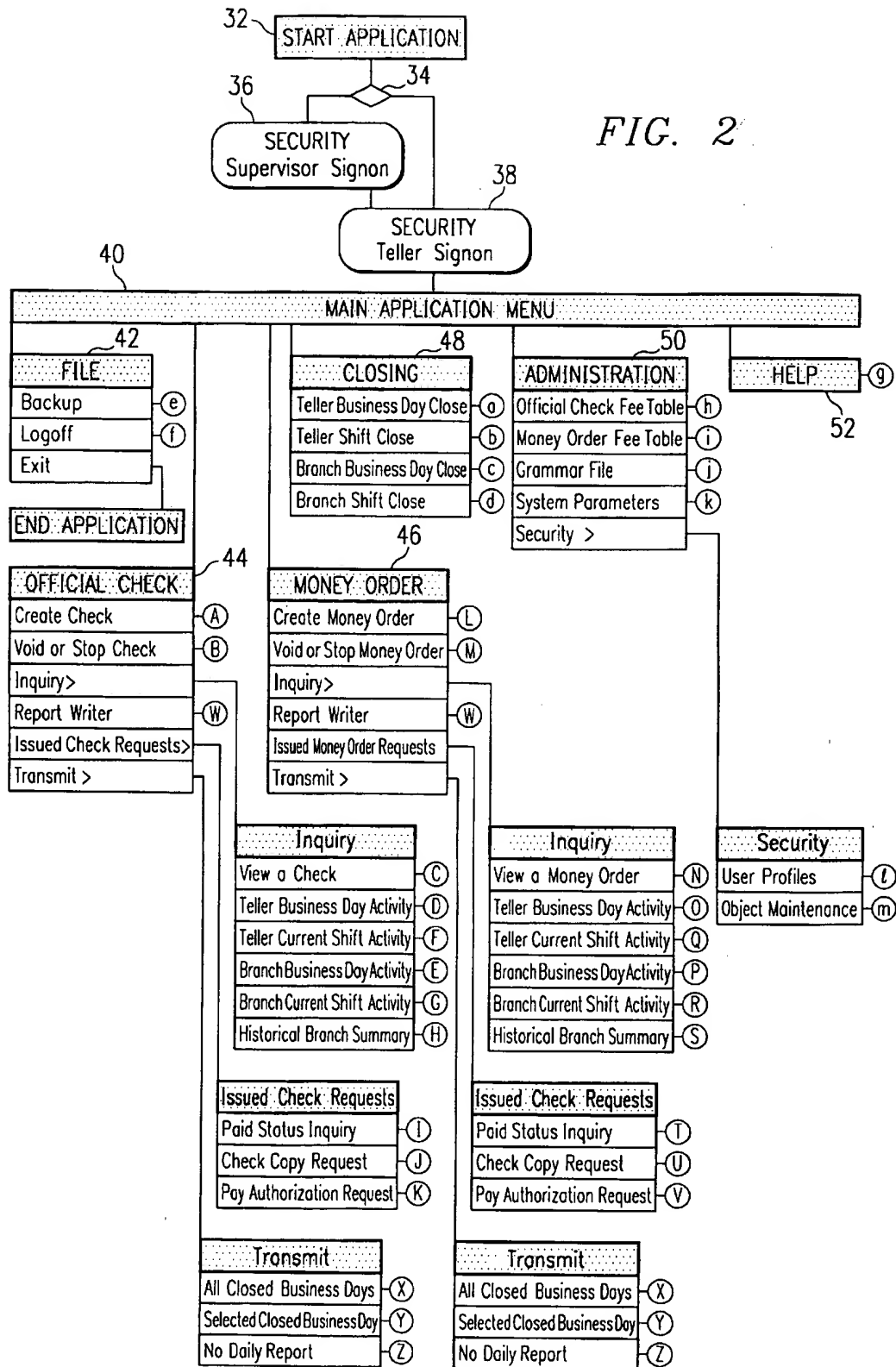


FIG. 2



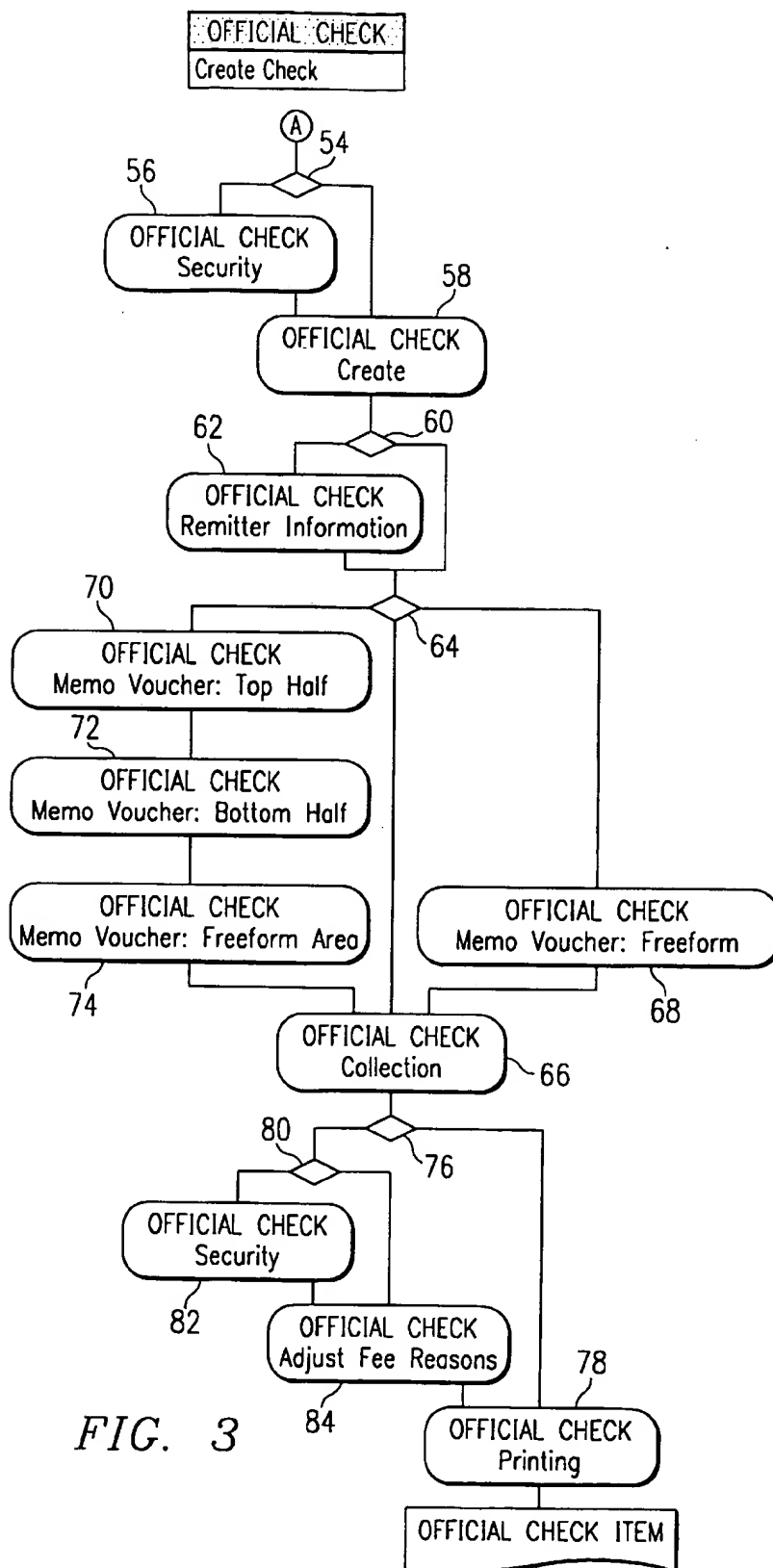


FIG. 3

FIG. 4

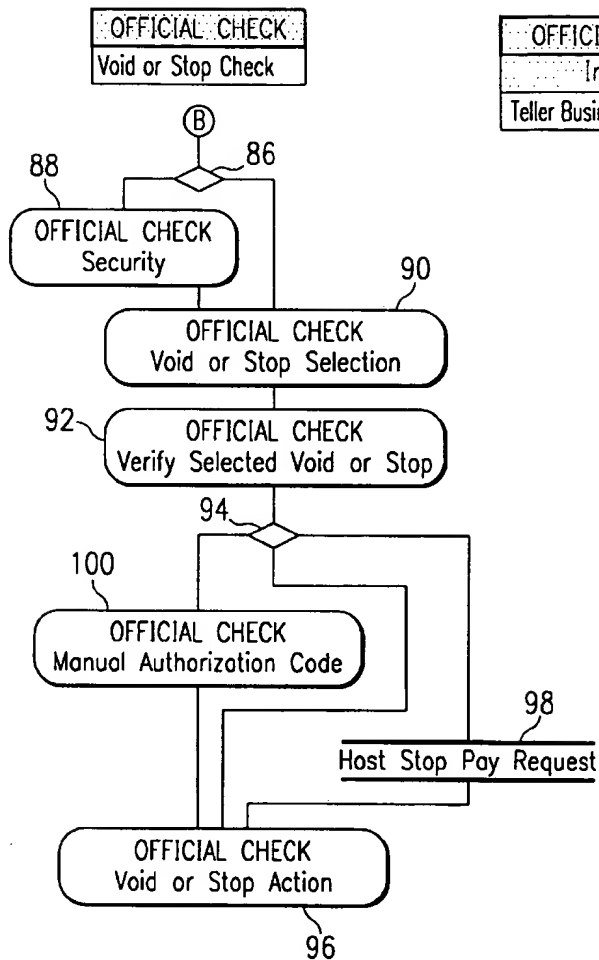


FIG. 6

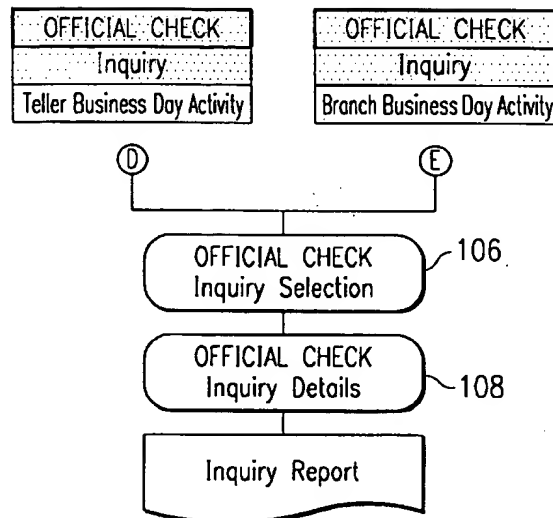


FIG. 5

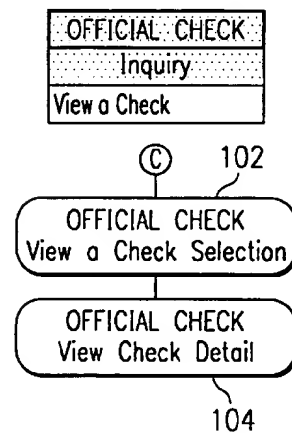


FIG. 7

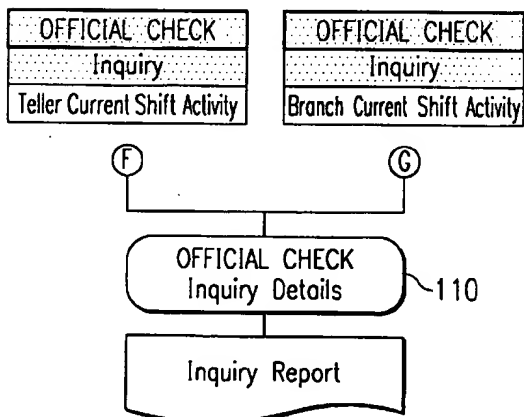


FIG. 8

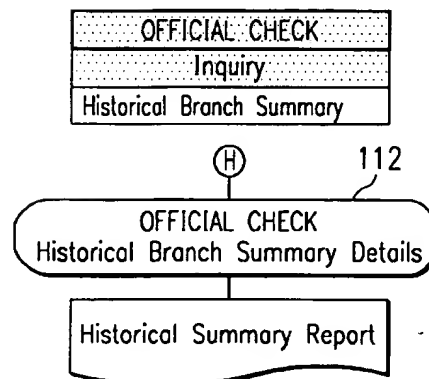


FIG. 9

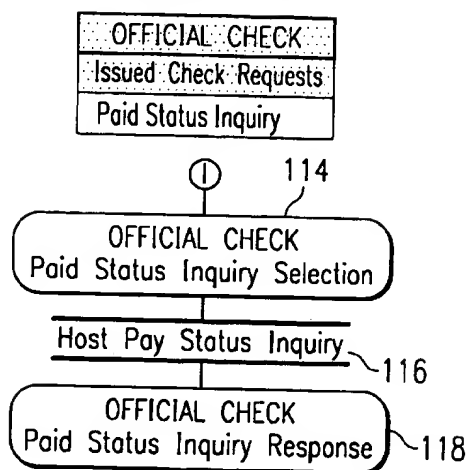


FIG. 10

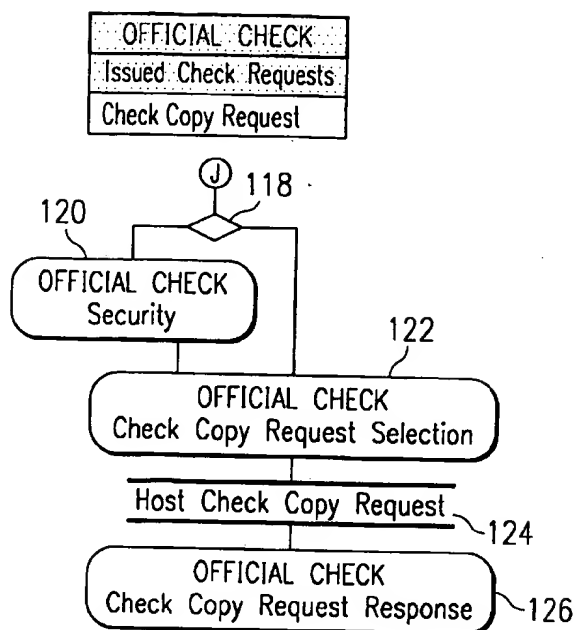


FIG. 11

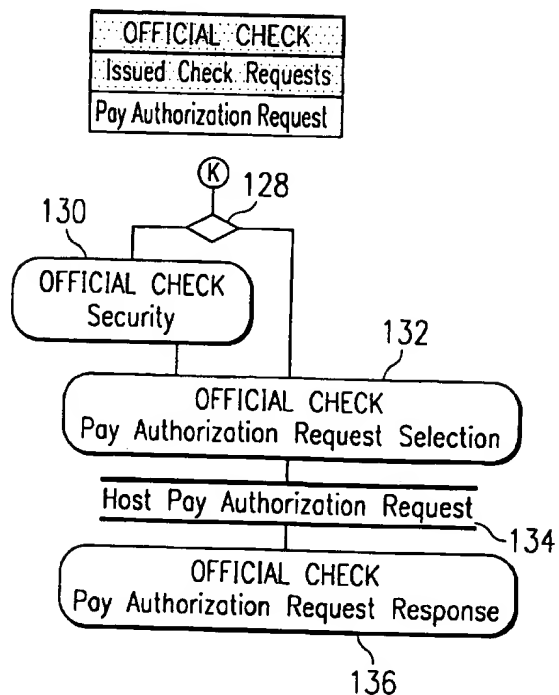


FIG. 12

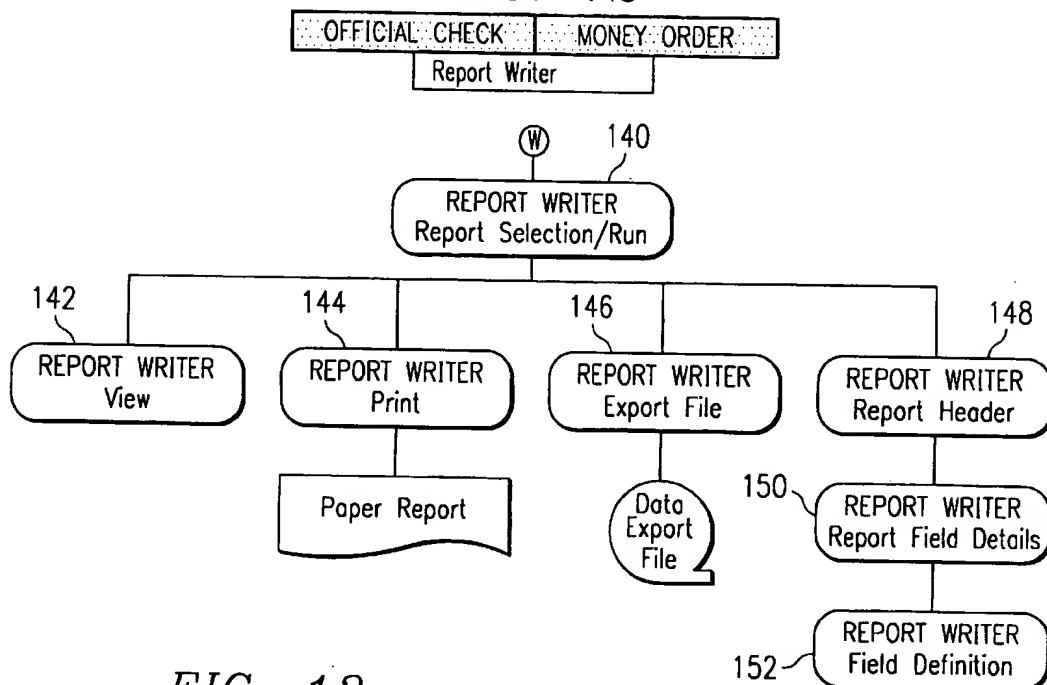


FIG. 13

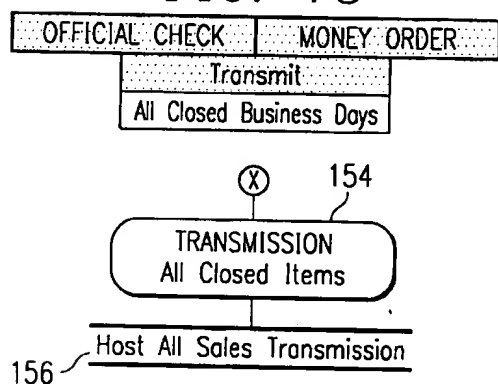


FIG. 14

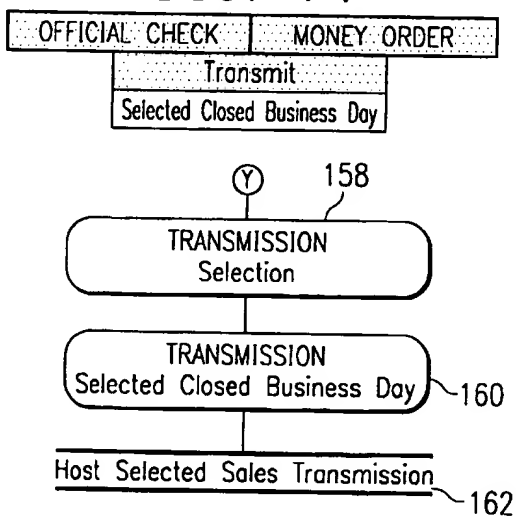


FIG. 15

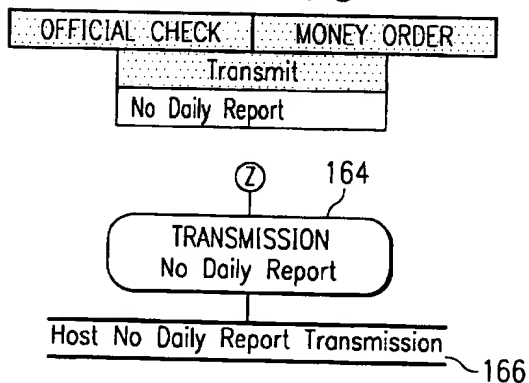


FIG. 16

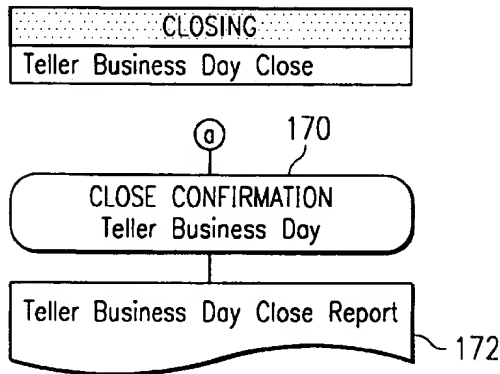


FIG. 17

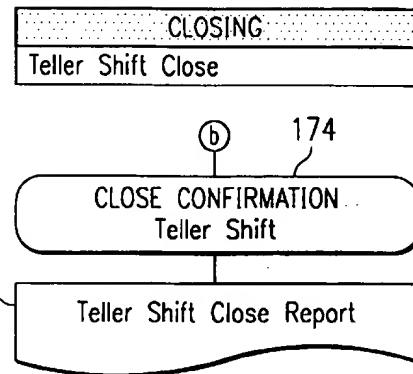


FIG. 18

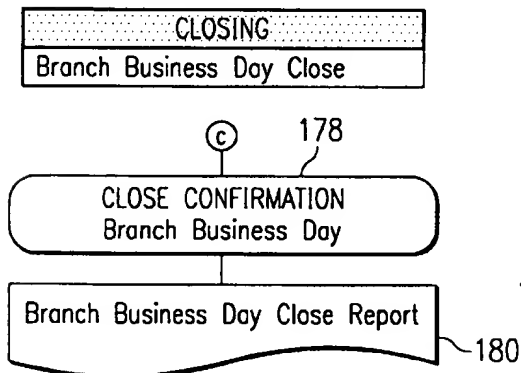


FIG. 19

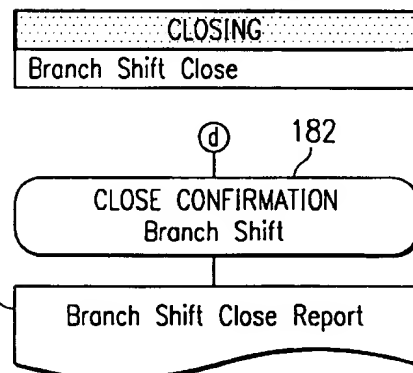


FIG. 20

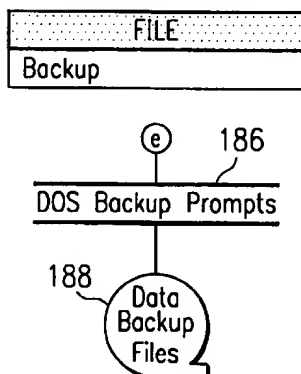


FIG. 21

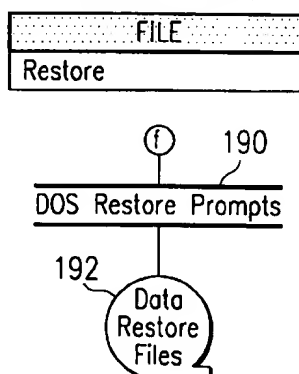


FIG. 22

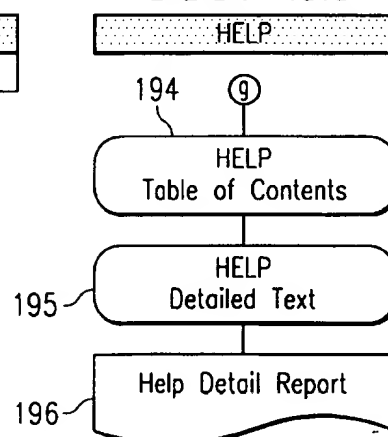


FIG. 23

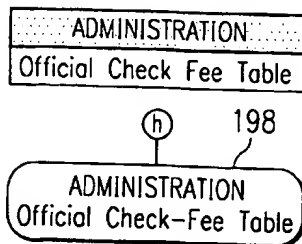


FIG. 24

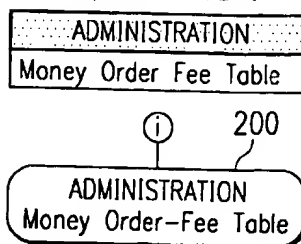


FIG. 25

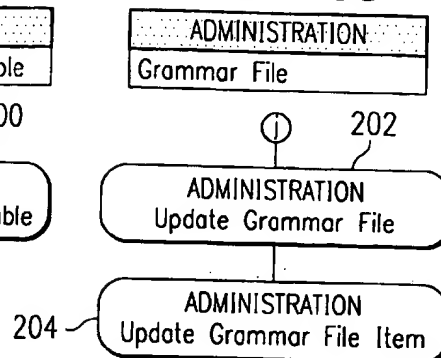


FIG. 26

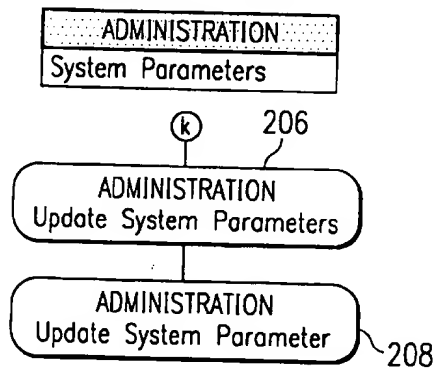


FIG. 27

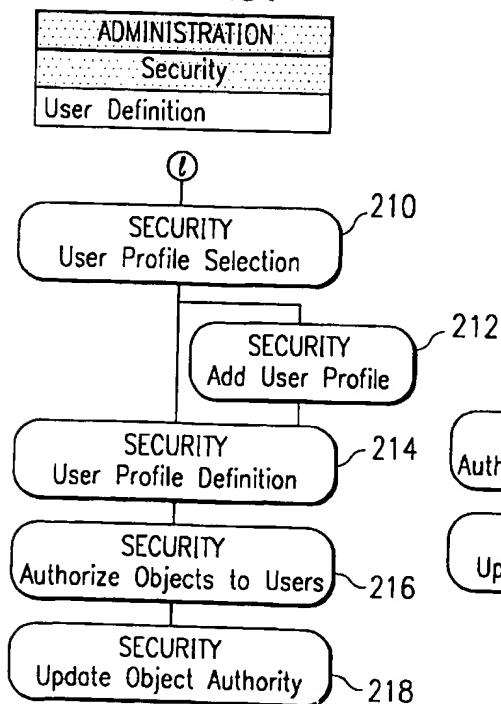
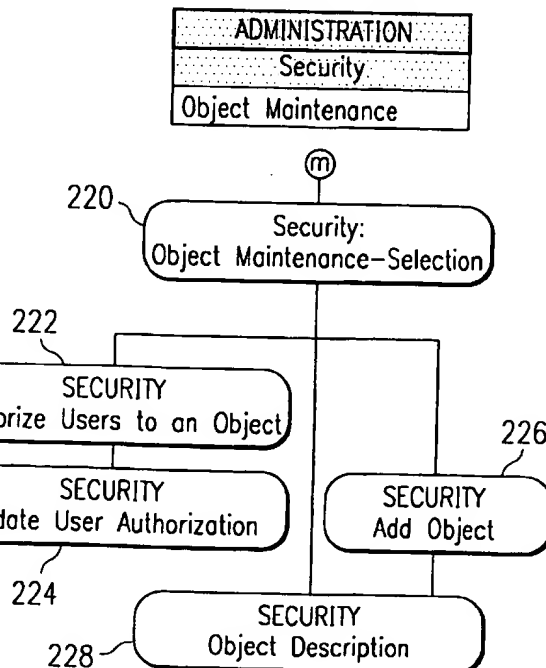


FIG. 28



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AUTOMATED FINANCIAL INSTRUMENT PROCESSING SYSTEM

This application is a continuation of application Ser. No. 08/173,907, filed Dec. 27, 1993, entitled "Automated Financial Instrument Processing System," by Jeanne M. Custy, Benjamin L. Knoll, Shunsaku Suguira and Brian W. Walsh, now abandoned.

TECHNICAL FIELD OF THE INVENTION

This invention relates in general to data processing systems and more particularly to an improved automated financial instrument processing system and method of operation.

BACKGROUND OF THE INVENTION

Automated systems for printing and delivering money orders have been developed and used in the past with some measure of success by both financial institutions and retail outlets. These systems provide the basic systems and methods of providing the transaction data to a printer which holds blank financial instruments such as money orders. The blank money orders are stored in the printer in a secure fashion to prevent fraudulent creation of money orders. The presence of blank money orders in the printer makes the system very vulnerable to the fraudulent creation of money orders and to mistakes in the creation of money orders such as the creation of duplicate money orders due to printer malfunctions, user data entry errors or other system malfunctions.

The systems that have been developed for creating and delivering money orders in the past have been systems with dedicated hardware and little, if any, interface with other systems such as general accounting systems, other data processing facilities or back-up and recovery facilities. Integration of the delivery and creation of financial instruments is necessary to provide adequate security for these facilities and to allow for communication of these subsystems with supervisory systems such as host accounting systems.

SUMMARY OF THE INVENTION

Accordingly, a need has arisen for an integrated financial instrument processing system that is generally portable to a variety of platforms and hardware architectures and provides adequate security during the creation and delivery of financial instruments. In accordance with the teachings of the present invention, an integrated financial instrument processing system is provided that substantially reduces disadvantages associated with prior art systems and methods of operation.

According to one embodiment of the present invention, a financial instrument processing system is provided that comprises a graphical user interface that is operable to communicate with a data base processing system. The graphical user interface and data base processing systems are monitored by a security processor which provides security for the system on a user-by-user and object-by-object basis. A printer is coupled to the print processing system and is operable to print financial instruments using information sent from the execution control processor. The print processor monitors printer messages and communicates with the security processing system to prevent unauthorized access to the printer. After receiving verification that the financial instrument has printed, the print processor passes transaction information to the data base processor. The information is then written to the transaction file.

According to another embodiment of the present invention, a communications processor is included and is

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operable to communicate with the data base processing system to provide information stored in the data base processing system to other systems such as host accounting systems.

According to an alternate embodiment of the present invention, a grammar file is provided that is operable to revise constants in the graphical user interface on a user-by-user basis. A parameter file is also provided to configure the general operation of the financial instrument processing system.

According to an alternate embodiment of the present invention, the software system of the present invention serves as an open platform to allow for the integration and processing of other financial applications or products. For example, the modular nature of the system of the present invention allows for the efficient integration and management of other products such as money grams, starter checks, variable amount coupons, gift checks or gift certificates, cashier checks, insta-pay functions, phone cards and the like. In addition, the modular nature of the system of the present invention allows it to be integrated with other teller applications. For example, the functions of the present system can be accessed through an alternate working environment that would replace the graphical user interface of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present invention may be acquired by referring to the accompanying FIGURES in which like reference numbers indicate like features and wherein:

FIG. 1 is a schematic block diagram of the financial instrument processing system constructed according to the teachings of the present invention;

FIGS. 2 through 28 comprise menu and flow chart representations of the financial instrument processing method of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The financial instrument processing system of the present invention comprises an object-oriented software system that is highly portable between various hardware platforms. The architecture of the integrated software system is constructed such that the system can be easily and conveniently ported to a variety of operating systems such as MS DOS, Windows, OS2, or UNIX. In addition, the system of the present invention is highly adaptable to network environments such as local area networks, wide area networks, mini-LANs and the like where the various components can be resident in physically separated servers. The architecture of the present invention is illustrated in FIG. 1 and comprises an execution control processor 10 which itself comprises a security processor 12 and a data base processor 14. The data base processor also comprises a report writer 16 and accesses data stored in transaction files 17. It should be understood that the term processor used herein refers to a software module operating to perform a particular task or group of tasks. A single such module may actually be running on a variety of hardware architectures which could include single or multiple hardware processors.

The data base processor 14 manages an ASCII flat file data base which uses relative record key accesses to provide for efficient storage and maintenance of the data used by the integrated system. The ASCII files are stored in transaction

files 17 and accessed as necessary by the data base processor 16. In one embodiment of the present invention, ASCII flat files are used to maintain portability between various, platforms and their operating systems. ASCII flat files are accepted without compatibility concerns by virtually all hardware platforms. According to alternate embodiments of the present invention, other more sophisticated data base systems may be used such as SYBASE or ORACLE provided that a particular hardware platform and operating environment to be used is compatible with such data base systems. More sophisticated data base products provide for intrinsic journaling, intrinsic mirroring and intrinsic data base recovery which may be advantageously used in the architecture of the present invention.

The data base processor 14 records the transactions performed by the integrated system in a largely chronological order, including audit information such as a teller performing the transaction, and the date and time of the transaction. The relative record key access system used by the data base processor 14 allows for an access to be performed within the data base processor 14 by jumping to the date of the transaction or record desired and then providing sequential access through the group of records associated with that date. In order to provide for the fastest access, the records are accessed within the date in reverse chronological order. This access method is used because, on average, the more recent records are the records that will be manipulated more frequently.

The data base processor 14 also communicates with a report writer 16 to allow for the compilation and output of report information in various formats such as data files, printed reports, and report inquiries.

The security processor 12 provides both user-level and object-level security. An object for the integrated system may comprise, for example, a particular file, reports created by the report writer 16, or a particular program or menu item. Under multi-processing platforms such as UNIX-based platforms, the security processor 12 may comprise an independent process such as a terminate and stay resident (TSR) program which functions to monitor the processing and accesses of all the remaining processes. Under single process platforms, such as MS DOS, the security processor 12 may be constructed within each object to monitor access to that object. Particular security routines relative to particular objects will be discussed more fully herein. In general, however, the security processor 12 provides for multi-level user and object-based security for the integrated system. For example, the security processor 12 provides for supervisory and general user security access to various objects. The security processor 12 interfaces directly with a graphical user interface 18 to monitor attempted accesses to various objects within the integrated system made by users of the graphical user interface 18.

The graphical user interface 18 may provide, for example, a mouse-driven or keyboard-driven user interface to allow for the efficient navigation of the various objects and capabilities of the integrated system. The graphical user interface 18 begins with a main application menu which allows the user to select a variety of capabilities of the system. The operation of the integrated system and the objects that are constructed to perform the various functions of the integrated system can be best understood by examining the menus and flow charts associated with the particular objects which will be described in more complete detail in FIGS. 2 through 28 herein. In general, however, the graphical user interface 18 interfaces with the security processor 12 in order to present the user with the appropriate options for that

user's security level. Further, the security processor 12 requires entry of a password or other security measures before the integrated system is allowed to progress through a particular object.

The execution control processor 10 is also coupled to a communications processor 20. The communications processor 20 allows the integrated system to communicate with other systems through network connections. According to one embodiment of the present invention, the communications processor 20 allows for communication with an integrated communications platform system to allow for session-based communications with a host computer. The operation of such a communications platform is fully described in U.S. patent application Ser. No. 08/130,297 entitled "INTEGRATED COMMUNICATIONS PLATFORM" filed Oct. 1, 1993 now abandoned, and assigned to the Assignee of the present application, the disclosure of which is hereby incorporated by reference into the present description as if set forth fully herein. The integrated system of the present invention allows the user to perform a variety of transactions which are logged in the data base of information managed by data base processor 14. Periodically, these transactions may be uploaded to a host computer or super server through the communications processor 20. In addition, a variety of maintenance and supervisory operations may be performed on the integrated system from a remote location using the communications processor 20. In this manner, the integrated system is remotely programmable and configurable. The communications processor 20 is constructed in such a manner to allow for the efficient communication with conventional modem-based communication or dedicated high speed data links. The communications processor 20 acts as an interface between the integrated system and whatever communication facilities are available via network connections. The communications processor 20 is independent of the communication facility such that the operation of the integrated system is not changed or affected depending on what sort of communication facilities are available to a particular implementation of the integrated system.

The execution control processor 10 is also coupled to a help processor 22 which provides chapter-sensitive help to a user of the integrated system. According to one embodiment of the present invention, the help file is chapter-sensitive in that the integrated system provides the appropriate chapter of a help file depending upon where the user is during the navigation of the integrated system. Chapter-sensitive help is a fast way of providing help that allows for easy adaption of the help file to a particular implementation. The help file is a text file which can be edited from within the execution control processor 10 to provide for specific help information for particular implementations. For example, the help file can be edited to provide names and telephone numbers of particular support personnel specific to an installation of the integrated system.

According to an alternate embodiment of the present invention, help processor 22 provides fully context-sensitive help based upon the cursor position at the time the user requests help. According to this embodiment, the user is provided with a portion of a help text file that is specifically addressed to the task being attempted by the user at that particular time. Fully context-sensitive help is not as fast or as easily adapted as chapter-sensitive help, but can provide for more specific information available to the user without further navigation within the help processor 22.

The operation of the integrated system is further enhanced through the use of grammar files 24 and parameter files 26

shown in FIG. 1. An important technical advantage of the integrated system of the present invention inheres in the fact that the grammar files 24 allow for user-sensitive programmability of the graphical user interface 18. In operation, a user identification is used by the integrated system to select an appropriate grammar file from which to provide the data for the fields within the screens of the graphical user interface 18. This data is taken on a field-by-field basis from one of the grammar files 24 applicable to the particular user of the integrated system. Accordingly, the fields of text that are used by the graphical user interface 18 are not hard-coded textual material, but are in fact variables that can be changed by manipulating the grammar files 24. In this manner, the graphical user interface 18 can be customized on a user-by-user basis. For example, a standard grammar file can be stored within grammar file 24 to provide for English textual material to appear within the screens of the graphical user interface 18. In addition, a foreign language equivalent of the standard grammar file can also be stored in grammar files 24 for use by users of the graphical user interface 18 fluent in that foreign language. In this manner, an English-speaking user and a Spanish-speaking user can use the identical functionality of the integrated system through graphical user interfaces which are customized to their particular language preference. In addition, the execution control processor 10 provides for editing capability of the grammar files to allow for particular installation of the integrated system to customize the grammar files to their own needs. For example, a particular financial institution might not refer to their personnel as "tellers" but might prefer the term "customer service representatives". Accordingly, the variable associated with the term "teller" within the grammar files 24 could be changed by a supervisor at that installation to "customer service representatives".

The grammar files 24 are linked through the security processor 12 to the profiles associated with particular users of the integrated system. In this manner, a user is shown the textual material within the graphical user interface 18 according to his preferences and according to his security level as monitored by the security processor 12.

The parameter files 26 provide for additional configurability for the integrated system. The parameter files 26 include values for variables associated with the operation of the integrated system that require more rigorous monitoring than those associated with the variable textual material within the grammar files 24. For example, the parameter files 26 may store fee structures, security codes, user identification codes, transaction dollar limits and printing parameters. These parameters are not fully variable in the sense that the values for the parameters must be within some defined range in order for the proper functioning of the integrated system. The execution control processor 10 and the security processor 12 cooperate to allow the editing of the parameters provided that the user attempting to do the editing has sufficient security and supervisory authority. The security associated with the parameter files 26 may comprise many levels. For example, a teller in a financial institution may not have access to any of the parameter files 26. A supervisor at the financial institution may have access to some parameters, but might not have access to identification numbers for the financial institution or for parameters which disable whole sections of the integrated system that are not implemented at that particular financial institution. In addition, the financial institution supervisor may not have access to particular dollar limits on transactions that have been imposed on that financial institution by the operator of a super server or host accounting facility.

Certain parameters within parameter files 26 can affect the operation of the graphical user interface 18. For example, a particular parameter might select a check format that requires a different set of data entry screens to be presented to the user.

The execution control processor 10 is also coupled to a print processor 28 which serves as an interface between the execution control processor 10 and a printer 30. In general, the print processor 28 operates to communicate data to be printed by the printer 30. The printer 30 serves to print the financial instruments such as money orders and official checks created and documented by the integrated system. The printer 30 also functions to print various reports associated with the operation of the integrated system. The printer 30 may comprise a laser printer that is capable of printing using a magnetic ink character recognition (MICR) font. The MICR font is used to place encoded characters on each of the financial instruments based on a standard as prescribed by the American Banking Association that can be read by magnetic character recognition systems used by the financial institution cashing the financial instrument. In addition to the ability to access a MICR font, the printer 30 has a variety of other security features to enable the secure operation of the integrated system. The printer 30 is capable of bidirectional communication through the print processor 28 to the execution control processor 10. In this manner, the printer 30 can request and receive a password from the execution control processor 10 prior to accessing the MICR font to create a financial instrument. This bidirectional communication further allows the printer to communicate error codes created during the printing process to the execution control processor 10 to allow the execution control processor 10 to establish which financial instruments have been created prior to the error condition and which have not been created prior to the error condition. These error codes may comprise, for example, data indicating that the printer is jammed, that the toner is low or out, that the printer is out of paper or off-line. The information as to exactly what has and has not been printed by the printer 30 is essential to proper accounting for the financial instrument. For example, if a series of financial instruments such as money orders are being printed and a printer jam occurs after two of them have printed, the execution control processor 10 must properly log the creation of two financial instruments and must attempt to recreate the third financial instrument. If the printer 30 were not able to communicate the error condition back to the execution control processor 10, the execution control processor 10 might assume erroneously that every item that was sent to print actually printed.

The ability of the printer 30 to access on a secure basis a MICR font allows for the creation of the financial instruments to be accomplished within the printer 30 from blank stock. The blank stock has no intrinsic value and cannot be used to fraudulently create financial instruments. As such, the blank stock need not be accounted for and secure storage of the blank stock is not necessary. As discussed previously, the use of the bidirectional communication and password-based security between the execution control processor 10 and the printer 30 through the print processor 28 prevents fraudulent use of the printer 30 to create financial instruments. If someone were to steal the printer 30, the MICR font could not be accessed because the printer 30 must receive the appropriate security signals from the integrated system prior to printing any financial instrument. According to one embodiment of the present invention, the printer 30 comprises a Hewlett-Packard Laser Jet 4 printer with the MICR font contained on a separate SIMM card within the

printer. The SIMM card also may comprise a secure numeric font that is used to print the amounts on the financial instruments. This numeric font includes characters that cannot be altered to fraudulently increase the amount of a financial instrument.

The integrated system described with reference to FIG. 1 may be constructed as a stand-alone unit with all components of the system residing, for example, in a personal computer coupled to the printer 30. In the alternative, the system of the present invention may be implemented in a network environment. In this environment, various processors described may be physically located in dedicated servers. For example, the graphical user interface 18 might be located in a user node while the execution control processor 10, the grammar files 24, the parameter files 26 and the help processor 22 might be resident in a file server coupled to the user node through the network. Under this implementation, the print processor 28 and the communication processor 20 may be located in dedicated servers as well. The system of the present invention is constructed as an object-oriented integrated system to allow for portability between a variety of both stand-alone and network-based platforms.

The modular nature of the architecture of the system of the present invention allows it to be efficiently integrated into existing systems. For example, the operations of the system of the present invention used to create and manage various financial instruments can be accessed through other software user environments in place of graphical user interface 18. In this manner, the functional capabilities of the system of the present invention can be integrated into existing systems using existing user interfaces. Existing capabilities other than the user interface can also be used. For example, existing communications facilities can be accessed in place of communication processor 20 in order to efficiently integrate new functionality into existing systems. Existing communications facilities can be used to transmit consolidated data from a variety of sources to a host facility.

FIGS. 2 through 28 illustrate the menu options available to a user of the integrated system as well as flow charts of the processing performed by the integrated system in response to the user's commands. FIG. 2 illustrates the sign-on security measures as well as the main application menu. Referring to FIG. 2, the application begins at step 32 and proceeds to a decision point 34 where a parameter is tested in parameter files 26 to determine whether or not a supervisor security level sign-on procedure is enabled. If a supervisor sign-on is required, the method proceeds to step 36 where a supervisor sign-on operation is performed. The security sign-on step 36 requires a supervisor to enter a recognized supervisor user identification and a password in order to begin the application for any users of the integrated system. The supervisor's sign-on process can also request supervisor verification of the business day for the application. Financial institutions usually perform transactions on a business day basis. After the supervisor has successfully signed on in step 36, the system of the present invention proceeds to step 38 where the teller sign-on and security operations are performed. The method can proceed directly from decision block 34 to teller sign-on step 38 if the parameter file 26 does not require a supervisor sign-on step. The teller sign-on step requires an input user identification to match an input password associated with that teller. After the security processor 12 has successfully checked the security for the particular teller signing on, the execution control processor 10 crosslinks the grammar file associated with the particular teller into the graphical user interface 18 so that the particular teller is presented with screen field

definitions taken from his/her selected grammar file. According to one embodiment of the present invention, a "time out" security function exists, where after a certain period of time expires, as defined in the parameter file, the program automatically logs off and returns to the main teller sign-on screen.

The integrated system then presents the main application menu 40 which is shown in detail in FIG. 2. The main application menu includes six sub-menus that are accessed as pull-down menus from the main application menu 40. The six sub-applications include the file sub-menu 42, the official check sub-menu 44, the money order sub-menu 46, the closing sub-menu 48, the administration sub-menu 50 and the help sub-menu 52. FIGS. 3 through 28 illustrate the sub-menu commands available to the user of the application and the flow chart representations of the steps performed by the integrated system in response to those commands.

The official check sub-menu 44 allows a teller to process a financial instrument referred to as an official check. When the teller selects the official check sub-menu 44, the first option presented in the pull-down menu is the create check option. FIG. 3 is a flow-chart representation of the operations performed by the integrated system to create an official check. The method illustrated in FIG. 3 begins at branch point A and proceeds to a decision block 54 where a determination is made by execution control processor 10 whether security procedures are required prior to creating an official check. This decision is based on information stored in parameter files 26. If security information is required, the method proceeds to step 56 where the user attempting to create an official check is asked once again to sign on with their user identification and password to insure that the same person that signed onto the main application is trying to create an official check. Further, the security processor 12 can once again check the user identification to make sure that the particular teller is authorized to create official checks. The method then proceeds from step 56 or directly from step 54 to step 58 where the first of the official check creations screens is presented to the user through the graphical user interface 18. The official check requires, at a minimum, the name of the payee, the name of the remitter and the amount of the official check. The method proceeds from step 58 to a decision block 60 where a decision is made as to whether or not additional remitter information is necessary. If additional remitter information is necessary, the method proceeds to step 62 where the remitter information is gathered and input into the integrated system. An important technical advantage of the present invention inheres in the fact that the methods used to create financial instruments automatically prompt the user of the integrated system to acquire remitter information when certain predetermined dollar amounts are exceeded. Under the Bank Secrecy Act, financial institutions are required to ask for the remitter's name and other identification materials when a particular remitter attempts to get financial instruments in excess of a particular dollar amount in a particular amount of time. These guidelines can be configured into the integrated system of the present invention to prompt the teller to ask for identification and to input that identification material into the data base processor 14. Accordingly, the system of the present invention provides for an automated system to comply with the guidelines of the Bank Secrecy Act and thus eliminates human error on the part of the teller that might result in non-compliance with the Bank Secrecy Act. The checks performed in decision block 60 are comparisons to values within the parameter files 26. As such, as the guidelines of the Bank Secrecy Act are amended or as other

financial institutions are required to obtain remitter information, the integrated system of the present invention can be reconfigured to comply with such changes. The graphical user interface 18 can provide specific screens to allow for the user to input the required remitter information so that the data can be captured and stored.

The parameter files 26 supply default values which are used during the creation of financial instruments to provide for default values of various fields on the financial instrument. Accordingly, the screen that is presented to the user when the user is preparing a financial instrument already has values for many of the fields. If the user chooses to edit these fields, the default value is replaced with the value entered by the user. However, the default value remains to form a complete financial instrument if the user does not edit the default value. In this manner, a particular financial institution can provide a set of defaults appropriate to that particular institution and save a teller a great deal of time in preparing financial instruments.

The method of the present invention proceeds from step 62 or directly from decision block 60 to a decision block 64 where a determination is made as to what form of official check is to be used by the system in this particular instance. The process described in FIG. 3 includes three different forms although other forms may be used by the present invention. The first form only includes the payee and the amount of the check and, as such, proceeds directly from decision block 64 to the collection block 66 with an extra copy of the check. Alternatively, the check can be of the free form variety as determined in decision block 64. The process would thus proceed from decision block 64 to block 68 where any appropriate material to be printed on the memo voucher for the official check can be input. Finally, the method may proceed from decision block 64 to block 70 where the top half of the memo voucher is completed by the teller. The method then proceeds to block 72 where the bottom half of the memo voucher associated with the official is completed. Finally, the method proceeds to step 74 where the free form area of the memo voucher associated with the official check is completed.

The method proceeds from step 74 to decision block 64 or step 68 to the official check collection block 66. In step 66, the system of the present invention uses the fee schedules within parameter files 26 to assign a standard fee associated with each amount of the official check. This standard fee is presented to the teller to obtain collection from the remitter. The method then proceeds to step 76 where a determination is made by the system or by the teller as to whether or not the standard fees may be waived or adjusted. If the standard fees may not be waived or adjusted, the method proceeds directly to step 78 where the printing of the official check takes place.

If at step 76 the waiver or adjustment of fees is allowed and requested, the method proceeds to a decision block 80 where the parameter files 26 are accessed to determine whether or not security is required prior to the waiver or adjustment of fees. If security is required, the method proceeds to step 82 where the appropriate supervisory authority must be provided before any fees can be waived or adjusted. Supervisory authority may comprise, for example, a user identification and password associated with an authorized user. The method proceeds from step 82 or directly from step 80 if no security is required to step 84 where the teller is asked to give or select a reason why the fees are being adjusted or waived. According to one embodiment of the present invention, the teller is provided with a menu of appropriate reasons to adjust or waive fees such as preferred

customers or errors on the part of the financial institution. The teller then logs the reason for adjusting the fees using the menu or by inputting new reasons and inputs the amount of the adjustment. According to one embodiment of the present invention, the adjustment of fee reasons is linked into the security associated with the particular user. Accordingly, if the teller selects from a particular set of preauthorized reasons, no security is required. However, if the teller inputs a new reason or selects from a different set of reasons for waiver or adjustment of fees, then a user with supervisory authority must provide the appropriate authority to log the waiver adjustment of fees.

According to one embodiment of the present invention, each particular implementation of the system of the present invention can include suggested adjustment amounts or percentages associated with the suggested reasons presented to the teller. For example, a preferred customer might be allowed a flat rate or percentage discount on fees. If the suggested amounts of discounts were altered by the teller, further authorization would be required. An important technical advantage of the present invention inheres in the fact that the reasons for waiving and adjusting fees and the record of how much of the fee was waived or adjusted is recorded in the data base associated with data base processor 14. Accordingly, the financial institution is provided with a log of exactly how much waiver and adjustment of fees is occurring on a teller-by-teller basis. The method proceeds from step 84 or directly from step 76 to step 78 where the official check is printed.

As discussed previously, the communication between the execution control processor 10 and the printer 30 through print processor 28 is a secure communications path. According to one embodiment of the present invention, the serial number of the printer is stored in the parameter files 26. This serial number is transmitted to the printer 30 before any printing takes place or alternatively, the printer 30 may transmit the serial number to the execution control unit 10. In either case, the serial number of the printer 30 is checked against the serial number stored in the parameter files 26 to verify that the correct printer is being used. The printer then responds over the bidirectional communications path with a request for the password associated with the printer. The integrated system of the present invention must respond to the printer 30 with the appropriate password before the MICR font stored in the SIMM board within the printer 30 can be accessed. The data is then retrieved from the data within data base processor 14 and transmitted as a data stream to the printer 30 through the print processor 28. Also, as discussed previously, any error codes generated by the printer during the printing of financial instruments are transmitted back to the execution control processor 10 to allow for the accurate accounting of partially created financial instruments or transactions. The MICR font may comprise numeric characters that are difficult to alter and may further comprise the spelling for each number printed under each numeric character.

The system of the present invention allows for the printing of captured material on financial instruments. For example, company logos and signatures can be captured and stored within the system. These logos and signatures can then be printed on an item when it is created. The system can be configured to selectively include a logo and to select from different signatures depending on, for example, the amount of the financial instrument.

The serial numbers associated with particular financial instruments are generated at the time of printing and printed on the blank stock with the remainder of the information

printed on the check. Accordingly, there is no need to maintain stock with serial numbers already preprinted on the stock. The blank stock used by the system of the present invention need not be stored in a secure environment because it is worthless until a serial number, a MICR code, and an amount are printed on the stock at the time of the creation of the financial instrument. In addition, logos, signatures and other information such as "fingerprint" codes can be printed on the financial instrument blank stock when the instrument is created. A "fingerprint" code comprises a character string printed with an extremely small font that may include an issue date, an issue time, a teller identification, a printer identification, a software version identification, an item serial number and an item amount. According to one embodiment of the present invention, the serial numbers associated with particular financial instruments can be self-generating in the sense that the financial institution identification number and a chronological identification of the particular financial instrument from that financial institution can be made a part of the serial number for a particular financial instrument. In this manner, processing of the financial instruments upon cashing of the financial instruments can be greatly simplified in that the serial number of the proffered financial instrument will identify the institution issuing the financial instrument. Whatever method is used to create or assign serial numbers, the serial numbers are not assigned to the financial instrument and the data base associated with data base processor 14 is not updated until printing of the financial instrument actually occurs. The contemporaneous creation of the financial instrument and the creation of the record within the data base prevents erroneous records from being created and changed within the data base.

FIG. 4 illustrates the method used by the system of the present invention when the user of the system selects the void or stop check selection from the official check sub-menu 44. The method proceeds from branch point B to a decision block 86 where a decision is made based on a parameter value within parameter files 26 as to whether or not security is required before a void or stop check function is performed. If security is required, the method proceeds to step 88 where a variety of security methods may be implemented. For example, the teller may be required to reenter his/her user identification and his password to be sure the teller who logged on to the terminal is requesting the void or stop check operation. Similarly, supervisory authority may be required to do a void or stop check operation. As such, a supervisor user identification and password may be required in step 88. The method proceeds from step 88 or directly from step 86 if no security is required to step 90 where the void or stop selection screen is presented to the user. The user inputs three basic pieces of information to the system. The user inputs a check number, a check amount, and an indication as to whether or not the party requesting the void or stop check has the check in hand. If the check to be voided is in hand, the teller can retrieve the check and a stop payment is not required. If the check is not in hand, a stop payment is required. The method proceeds from step 90 to step 92 where the information input by the teller is displayed for verification. The teller can cancel the operation. The data base is accessed prior to step 92 to match the check number with the appropriate check amount.

The void or stop check operation is different depending upon whether or not the financial instrument to be voided was issued on the same business day or a previous business day. If the financial instrument was issued on the same business day, the transaction can be retrieved from the data

base and zeroed out to completely correct the accounts associated with the transaction. However, if the financial instrument was issued on a prior business day, a corrective transaction must be entered in the current business day in order to bring all accounts into balance. It is not proper in normal operations of financial institutions to access a transaction from a prior business day and change the transaction data. This is due to the fact that transactions are customarily recorded and financially balanced on a business day by business day basis. Accordingly, a countering transaction must be entered in a later business day to adjust the accounts into balance.

Referring to FIG. 4, the method proceeds to a decision block 94 where a determination is made as to whether or not a stop payment is required and if a stop payment is required, whether or not the particular implementation of the system enjoys the ability to do automatic stop payments using the communications processor 20 and network communications facilities as specified in parameter files 26. If no stop payment is required, the method proceeds directly to step 96 where the transaction is either voided from the current business day or a countering transaction is entered in the current business day. If the system enjoys the capability to perform automated stop payments, the method proceeds to step 98 where a host stop pay request is performed by establishing contact with the host through communications processor 20 and the network connections discussed previously. In this manner, the host will log the stop pay request and prevent cashing of the check when the check is presented to any financial institution associated with the host system. If at decision block 94 the automated stop payment operation is not available at the particular time or is not available to that system, the method of the present invention proceeds to step 100 where the teller is prompted to perform a manual stop payment request by manually calling personnel associated with the host computer to obtain authorization and log the stop payment. After the stop payment authorization code is received back in the manual transaction, the authorization code is entered into the system and the method proceeds to step 96 where the stop payment action is logged and the voiding transaction is recorded.

An important technical advantage of the present invention inheres in the fact that all communications with the host system through the communication processor 20 also involve security procedures. For example, a particular financial branch contacting the host system through the communications processor 20 and network connections can only access information relative to that branch. For example, in the process described previously, if a branch were to attempt to do a stop payment on a check that was not issued by that financial institution, the host would transmit information to the system through the communications processor 20 which would disallow the transaction. This type of security is used whenever a particular system at a financial institution communicates with the host system. For example, as will be described herein, financial institutions will sometimes make inquiries about transactions or financial instruments to the host system. The host computer utilizes security routines to prevent a party from calling in and acquiring about any information on a financial instrument not issued by that financial institution.

FIGS. 5, 6, 7 and 8 relate to the operations performed under the official check sub-menu 44 and the inquiry sub-menu within the official check sub-menu 44. Referring to FIG. 5, the view a check option causes the application to branch from branch point C to a step 102 where an information gathering screen is presented to the user through the

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graphical user interface 18. The user inputs the check serial number. The method then proceeds to step 104 where the execution control processor 10 retrieves the detail data from the data base associated with data base processor 14 and displays the check detail through the graphical user interface 18.

The inquiry functions do not require communication outside of the integrated system. The inquiry functions are merely accessing information stored in the data base associated with data base processor 14. The user has the capability to configure the amount of data that is maintained by the data base processor 14 using the parameter files 26. For example, a user may choose to maintain a single business day's, a single business week's, or a single business month's worth of data even after such data is uploaded to a host system. This data is maintained largely for the purposes of making inquiries such as those described with reference to the inquiry sub-menu under the official check sub-menu 44. The view a check process described with reference to FIG. 5 previously will often be used by a teller prior to entering the void or stop check process described with reference to FIG. 4 to insure that the check is a check that is accessible by the particular user.

FIG. 6 illustrates the operations performed by the system in performing the teller business day activity and the branch business day activity functions under the inquiry sub-menu. Both of these processes proceed to a step 106 where the particular inquiry business day is selected by the user. Upon receiving the appropriate inquiry, the system presents the user in step 108 with the sequential detail of all transactions entered by the teller or by the branch depending upon the selection made in step 106. The user is presented with an option in step 108 to print a report which includes the detail presented in step 108.

Similarly, FIG. 7 illustrates the operation of the system of the present invention in performing the teller current shift activity operation and the branch current shift activity operation under the inquiry sub-menu. When either of these items are selected, the method proceeds to step 110 where the details of each transaction recorded by the teller during the current shift or the branch during the current shift are presented through the graphical user interface 18. The user is presented with the option of once again printing a report of the detail presented.

FIG. 8 illustrates the operations performed by the system of the present invention to present historical branch summary data. When this function is selected under the inquiry sub-menu, the method proceeds to step 112 where the historical branch summary totals by business day are presented. Once again, the user is given the option of printing a historical summary report. The user identification requesting the particular activities may be checked by the security processor 12 for some of the functions described. For example, the branch business day activity and the branch current shift activity may require supervisory identification before access is allowed to such data. In order to perform the security checks, the security processor 12 accesses the profile of the user signed on at that particular time to determine whether that user has access to the various functions requested. If the user does not have access to that function, a security violation message is displayed for the user and the requested functions are not performed.

FIG. 9 illustrates the operations performed by the system of the present invention in order to do a paid status inquiry operation under the issued check request section of the official check sub-menu 44. Once the paid status inquiry is

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selected, the method proceeds to step 114 where the user is presented with an inquiry screen and inputs the item number which may comprise, for example, the check serial number for an official check. The system of the present invention then uses this serial number to access the data files of the host computer through the communications processor 20 and network connections as described in step 116. The host computer returns all information associated with the particular item and in step 118, and the information is displayed to the user. Typically, the user is performing the paid status inquiry to determine if a particular financial instrument has been paid or is authorized for payment. If a financial instrument has been paid, a stop check or void cannot be performed on that particular financial instrument. Typically, a teller will perform a paid status inquiry function before attempting the void or stop check function described with reference to FIG. 4 previously.

FIG. 10 illustrates the operations performed by the system of the present invention to perform a check copy request operation under the issued check request sub-menu of the official check sub-menu 44. Once the check copy request operation is selected, the method proceeds to a branch point 118 where a determination is made using the parameter files 26 as to whether or not security is required to perform a check copy request. In general, the check copy request is an automated method that a financial institution can use to log a request for a copy of a financial instrument that has already cleared and is being held by a supervisory accounting service operating the host computer to which the financial institution is connected. According to one embodiment of the present invention, cleared items are captured optically and maintained in a host-based imaging system. When a check copy request is received, the optical image is retrieved from the host and transmitted via facsimile or modem to the local system where the cleared item is printed using printer 30. The security step performed in step 120 shown in FIG. 10 may be necessary because the check copy request operation is usually associated with a fee to the financial institution. As such, only certain authorized personnel may be allowed to perform the check copy request function. Once the security checks have been performed in step 120 or directly from step 118, the method proceeds to step 122 where the item number is retrieved from the user. The method then proceeds to step 124 where a connection is made through the communications processor 20 and the network connections described previously to the host computer. The host computer will then log a request for a copy of the particular item and the staff associated with the host computer will make the physical copy and mail it to the financial institution. The host computer returns an acknowledgment of the logged check copy request to the system of the present invention through the communications processor 20. This response is displayed to the user in step 126.

FIG. 11 illustrates the operations performed by the system of the present invention to perform the pay authorization request function under the issued check request section of the official check sub-menu 44. The pay authorization request is essentially the opposite of a stop payment request. When a financial institution is presented with a financial instrument to be cashed, the financial institution can contact the host computer to receive an authorization for cashing an item. The method begins when the pay authorization request is selected and proceeds to a decision block 128 where a determination is made by accessing the parameter files 26 as to whether or not a security check is required prior to making a pay authorization request. If a security check is required, the security check is performed in step 130 using the

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methods described previously. The method proceeds from step 130 or directly from step 128 to step 132 where the identification information from the financial instrument is input into the system of the present invention. This can include the serial number of an official check and the amount of the check or other information specifically identifying the particular financial instrument. Once the information is received from the user, the system of the present invention establishes contact in step 134 with the host system through the communications processor 20 and the network connections as described previously in step 134. The host system then checks to see if any stop payments have been issued for that financial instrument. If no stop payments are issued and no other irregularities exist related to the financial instrument, the host system will return an authorization to the system of the present invention which is displayed for the user in step 136.

FIG. 12 illustrates the operations performed by the system of the present invention when the report writer facility is selected under the official check sub-menu 44 or the money order sub-menu 46. The operation continues from a branch point W to a report selection step 140 where the user is presented through the graphical user interface 18 with a selection screen. The user is presented with a list of formatted reports that may be compiled from the information stored in the data base associated with data base processor 14. The user has the option of running any of the formatted reports in the background or to view, print or export reports that have already been run. If the user selects to view a report, the method proceeds to step 142 where the detail data from the report is presented to the user through the graphical user interface 18. If the user elects to print a report that has already been run, the method proceeds to step 144 where the report data is formatted and output to the printer 30 through print processor 28. The user also has the option to proceed from step 140 to step 146 where the print data is exported as a data file. In step 146, the user is asked in what format the data should be placed and what file name the data should be assigned. The data may be formatted, for example, as an ASCII delimited or ASCII fixed data file. In step 140, the user also has the option to define new customized reports or modify existing report definitions. If the user selects this option, the user proceeds to step 148 which asks the user to input the header for the report. The header for the report is a general description of the data to be presented in the report. The method then proceeds to step 150 where all the fields that are available to the user are presented. The user then selects which fields are to be included in the report. The method then proceeds to step 152 where the user specifies the sort order, selection criteria, and other field definition selections for the particular report being configured. For example, the user can elect to sort on a particular field and select only data records having a field value within particular range of values.

Using the reporting capabilities and fee management systems of the present invention, financial institutions can compile fee management reports that present detailed information as to the amounts of fees collected by the institution and particular personnel and, specifically, the amount of adjustments to fees and associated reasons for adjustments made by various personnel. In addition, the reporting capability of the present invention can be used to automatically create reports comprised of the information required of the Bank Secrecy Act. The system of the present invention, as discussed previously, can automatically prompt the teller to gather the remitter information required to comply with the Bank Secrecy Act and automatically generate a report of such information contemporaneously with the transaction.

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FIGS. 13, 14 and 15 relate to the transmit function under the official check sub-menu 44 and the money order sub-menu 46. The transmit functions are largely a back-up to the automated transmissions used by the system of the present invention to contact the host system through the communication processor 20 and the network connections as described previously. The transmit functions described with reference to FIGS. 13, 14 and 15 are manual transmissions which are used if the automatic transmission of data to the host does not occur for some reason. For example, FIG. 13 illustrates the transmission of all transactions which are closed but not yet transmitted. The method proceeds from branch point X to a step 154 where the system of the present invention polls the data base associated with data base processor 14 and selects all transactions which have been closed but which have not yet been successfully transmitted to the host system through the communications processor 20. The method then proceeds from step 154 to step 156 where a communications path is established through the communications processor 20 and the network connections as described previously to the host system. Once a communications path has been established, all the selected transactions are transmitted to the host system and the transactions are flagged within the data base associated with data base processor 14 as being successfully transmitted.

FIG. 14 illustrates a similar operation as that described with reference FIG. 13 for a selected closed business day. The method proceeds from branch point Y to a step 158 where the user is asked to specify a particular closed business day to transmit. The method then proceeds to step 160 where the records associated with that business day are selected. This function can be used for original transmission of data or for the transmission of data that had already been transmitted previously. The method then proceeds to step 162 where the selected records are transmitted to the host using the method described previously with reference to FIG. 13.

FIG. 15 represents the process used by the system of the present invention to make a test transmission to the host system. The method proceeds from branch point Z to a step 164 where the user confirms that the test transmission is to take place. The method then proceeds to step 166 where a communications path is established with the host computer in order to verify that the communications processor 20, the network connections, and the communications facilities associated with the host computer are all functioning properly.

It should be understood that under ordinary circumstances, the system of the present invention will automatically transmit all closed transactions to the host computer on a periodic basis. For example, the configuration files stored within the parameter files 26 can establish a time during off hours where an automatic connection with the host system is made via the communication processor 20 and the network connections. Once this connection is made, the system of the present invention will automatically upload all of the closed transactions to the host system that have not yet been successfully transmitted.

Referring again to FIG. 2, the money order sub-menu provides identical options as the official check sub-menu 44 for the creation and processing of money orders. The screens presented to the user through the graphical user interface 18 and the operations performed by the execution control processor 10 are substantially identical to those described previously with reference to the official check sub-menu 44 and the operations accessible thereunder. The primary substantive difference between the money order financial instru-

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ment and the official check financial instrument is that a money order traditionally has a much smaller maximum value and, as such, the system of the present invention allows for the automatic or manual creation of multiple money orders in a single transaction. For example, if the maximum dollar amount for a money order was \$500.00 and a customer requested money orders in the amount of \$700.00, the system of the present invention would automatically create a \$500.00 money order and a \$200.00 money order to complete a single transaction. In addition, the system of the present invention allows for a teller to create many different money orders to different payees using the same screen before printing any of the money orders. Each of the money orders created can be edited before the entire batch of money orders is sent to print through the print processor 28 to the printer 30.

The creation of multiple financial instruments at one time requires that the system of the present invention monitor closely the printing of the multiple financial instruments in the event of printer malfunction. For example, if four money orders are sequentially processed from a single transaction and the printer runs out of paper or is jammed in the middle of printing the four money orders, the system of the present invention must receive exact information as to which, if any, of the money orders were printed prior to the printer running out of paper or entering the jammed condition. As discussed previously, the system of the present invention enjoys bidirectional communication with the printer 30 through the print processor 28. As such the specific error messages retrieved from the printer 30 can be used to automatically account for which financial instruments have been printed and which must be retried. Accordingly, if multiple money orders are being printed and an error condition occurs during the printing, the money orders that have been printed will be logged as completed transactions and the system of the present invention will automatically prompt the user with the error condition associated with a particular incident and will ask the user if they want to retry printing the remaining money orders.

The remaining functionality shown in FIG. 2 under money order sub-menu 46 is performed identically to those described with reference to the functionality described under the official check sub-menu 44.

FIGS. 16 through 19 involve the operations performed by the system of the present invention under the closing sub-menu 48. In general, the closing operation can be performed by the system of the present invention in two ways. The system of the present invention utilizes an automatic close operation that is performed periodically to insure that a financial institution does not skip a business day. However, the typical closing operation will be performed in response to an operation specified using the graphical user interface 18 under the closing sub-menu 48. FIG. 16 represents the operations performed for a teller business day close operation. The method of the present invention begins at branch point a and proceeds to a step 170 where the teller confirms the closing of the current business day and confirms the date of the next business day as predetermined. All transactions for the teller's closed business day are then printed in a close report at step 172. When the first teller closes for a given business day, a supervisor approval is required to establish the new business day; subsequent teller and business day closes for the same day may not require confirmation of the new business day. All transactions entered by that teller after the close operation will then be entered on the next business day entered by the teller. FIG. 17 illustrates the teller shift close operation. The method of the present invention begins

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at branch point b and proceeds to a step 174 where the teller confirms a shift close. A number of shifts can occur during the business day. The teller shift close operation allows for a teller to prepare periodic reports during a business day without affecting the business day to which the transactions before and after the report are logged. The method proceeds from step 174 to step 176 where a teller shift close report is printed with the transactions for that teller shift.

FIG. 18 illustrates the operations performed by the system of the present invention to perform the branch business day close operation. The method of the present invention begins at branch point c and proceeds to step 178 where someone with supervisory authority and security clearance confirms the branch business day close operation. The method then proceeds to step 180 where a branch business day close report is prepared. The branch business day close operation is similar to the teller business day close operation except it closes all teller accounts simultaneously for the branch. Branch-close operations and teller-close operations can be mixed. For example, a branch-close operation can be used to close all the remaining open tellers, and to produce a close report for the entire branch.

Similarly, FIG. 19 represents the branch shift close operation. The method of the present invention proceeds from branch point d to step 182 where someone with supervisory authority and security clearance confirms the branch shift close operation. The method then proceeds to step 184 where a branch shift close report is printed. The branch shift close operation is similar to the teller shift close operation except that the branch shift close operation simultaneously prepares an interim report for all tellers within the branch.

According to one embodiment of the present invention, the security processor 12 requires security checks during the closing operations. For example, as described previously, the branch closing operation illustrated with reference to FIGS. 18 and 19 may require supervisory authority prior to performing these operations. Further, supervisory authority may be required in specifying the next business day for a teller or a branch in order to prevent errors in establishing the next business day applicable to the financial institution.

An important technical advantage of the present invention inheres in its flexibility in separating business days and actual days during the preparation of financial instruments. For example, the ability to selectively close particular tellers' business days without affecting the operation of the preparation of financial instruments allows the system of the present invention to efficiently distribute financial instruments that are dated with the actual date regardless of the business day to which those financial instruments are attributed. Further, the ability to close particular tellers or to close an entire branch allows for flexibility in the operation of a particular financial institution or retail establishment. In large financial institutions, the closing operation can be very complex in that it requires supervision on a teller-by-teller basis. The flexibility of the software system of the present invention allows for the supervision of closings to occur without affecting the operation and distribution of financial instruments from remaining tellers in the branch.

FIG. 20 represents the operations performed by the system of the present invention when the back-up utility is invoked under the file sub-menu 42. When the back-up utility is invoked, the method proceeds from branch point e to step 186 where the conventional DOS-based back-up utilities are invoked to create conventional data back-up files of all updatable files at step 188. These files may comprise, for example, the transaction files, grammar files, parameter files, and help files.

Similarly, FIG. 21 represents the operations performed by the system of the present invention when the restore operation is chosen from the file sub-menu 42. The method of the present invention follows from branch point f to step 190 where the conventional DOS restore utilities are invoked. The method follows the DOS restore operations to retrieve data from the DOS back-up files and to create the restored files at step 192.

Submenu 42 also includes the "logoff" and "exit" functions. When invoked, the logoff function returns the teller to the teller sign-on step 38 described previously. The exit function terminates the application.

FIG. 22 illustrates the operations performed by the system of the present invention when the help sub-menu 52 is invoked by the user. The method proceeds from branch point g to a step 194 where the table of contents for the help file is displayed to the user. The user can then navigate through the table of contents to a particular chapter and the method will proceed to step 196 where the detailed text for that particular chapter is displayed. The user has the option with a displayed chapter to print the detailed text at step 196. As described previously, the help utility may be invoked by a user during operations outside of the context of the main application menu 40. In these contexts, the help is context-sensitive at the chapter level. In other words, a user that is practicing a particular operation performed by the system of the present invention will be directed to the chapter associated with that operation. FIG. 22 illustrates the invocation of the help utility from the main application menu where the table of contents is first presented to the user in step 194. Also, similarly, as was described with reference to grammar files 24, the help file presented to the user may be cross-linked with the user identification. Accordingly, user's help is configurable to the particular user's need. This may be used to provide foreign language help to user's fluent in that foreign language. In addition, the particular help file may be customized to fit a particular installation. For example, a particular teller installation might be directed using the help file to contact a direct supervisor in certain circumstances. Neighboring tellers might be directed to contact different supervisors under the same circumstances.

FIGS. 23 through 28 illustrate the operations performed by the system of the present invention under the administration sub-menu 50. In general, the administration sub-menu 50 will be closely guarded by the security processor 12 due to the nature of the operations performed therein. In general, the administration sub-menu 50 deals with alterations to parametric values that are used during the operation of the system of the present invention. As such, supervisory authority is usually required to adjust any of the values. Further, many of the values changed through the administration sub-menu 50 must be within ranges or be values of a particular nature such as numeric values in order for the system of the present invention to operate properly. As such, the operations performed under the administration sub-menu 50 in many circumstances contain field-by-field checks to make sure that the values entered by the person adjusting the parametric values have entered appropriate values.

FIG. 23 illustrates the method used by the present invention to adjust the official check fee table. The official check fee table is stored within parameter files 26 and is accessed in step 198 by a user with suitable supervisory authority. The official check fee table is a table of dollar amount ranges and a fee associated with that range. Both the ranges and the fee for that range can be adjusted by the user.

FIG. 24 illustrates the operation performed by the system of the present invention to adjust the money order fee table.

The money order fee table is virtually identical to the official check fee table and is adjusted at step 200 by a user with similar supervisory authority.

Although the present invention has been described with fee tables and fee management functions associated with the creation of financial instruments, it should be understood that similar functionality may be associated with other chargeable activities. For example, similar fee management routines can be used for fees associated with stop payment requests and check copy requests.

FIG. 25 illustrates the operations used by a user of the present invention to edit a particular grammar file stored in grammar files 24. Once the grammar file operation is invoked under the administration sub-menu 50, the method proceeds from branch point j to a step 202 where grammar file items are listed and selected to be edited. The method then proceeds to a step 204 where the selected item in the grammar file is displayed for the user and the user can change the textual material displayed for the item within the grammar file. As discussed previously, the grammar file includes variable identifications for the various fields within the screens of the graphical user interface 18. The system of the present invention can be configured and customized for a particular user's needs by changing the contents of a particular grammar file. The grammar file to be used with a particular user is cross-linked with the user's identification so that a particular grammar file and the graphical user interface 18 are cross-linked at the time the user logs on. In this manner, the system of the present invention can be customized to a particular user's needs without necessity of hard-coding the various screens within the graphical user interface 18.

Similarly, FIG. 26 represents the steps used by the system of the present invention to alter the system parameters stored within parameter files 26. Once the system parameters operation is selected under the administration sub-menu 50, the method proceeds from branch point k to a step 206 where system parameter file items are listed and selected to be edited. The method then proceeds to step 208 where the selected system parameter within the parameter file is displayed for the user and may be edited by the user. The security processor 12 closely monitors the editing process to insure that the values input by the user fall within any necessary ranges for the system parameters. For example, a system parameter might be associated with the time in which the automated upload process is performed on a daily basis. The security processor 12 will insure that the value input by the user with the appropriate security is a valid time. Further, as discussed previously, the system parameter values may be subdivided into those accessible to day-to-day users, the system administrator and persons servicing the software. A day-to-day user may have particular system parameters available to him/her such as those associated with display colors and other hardware configuration parameters. A system administrator might be able to change the time for the automated caller proceeding or other global parameters associated with the operation of the financial institution site and the persons servicing the software might be the only users allowed to change the serial number associated with the financial institution or the telephone number to be called for the automated call-up. The security processor 12 monitors the access requested and will allow the parameters to only be edited by persons having the required security level.

According to one embodiment of the present invention, the parameters stored in parameter files 26 may be accessed and edited remotely through the network connections and communications processor 20. The access to the parameter

files 26 from a remote host is also managed by security processor 12. In this manner, the system of the present invention can be remotely maintained and configured using a remote host system.

FIGS. 27 and 28 illustrate the operations performed under the security sub-heading under the administration sub-menu 50. In general, the security operations are only accessible to a system administrator in that they generally deal with the ability of particular users to access various capabilities of the system. The security user definition and object maintenance operations provide information to the security processor 12 as to what particular objects are available to what particular users.

FIG. 27 illustrates the operations performed by the system of the present invention to define new user profiles and to edit existing user profiles. The method proceeds from branch point 1 to a step 210 where a particular user profile is selected from a list of existing users. The user also has the option to add a new user. If the user makes such a selection, the method proceeds to step 212 where the new user identification is received from the user and the user may copy an existing user profile for the new user. The method proceeds directly from step 210 or from 212 to step 214 where the user profile is defined and a password for the new user is requested and confirmed. The method then proceeds to step 216 where the objects are listed for a particular user. The method then proceeds to step 218 where the tables that store the authorization for each object for a particular user is updated. A user profile comprises information identifying the user; his password; his authority designation of teller, supervisor, branch manager, or administrator; a help file designation; a grammar file designation; specific user parameters; and object authority security. The levels of object authority comprise no authority, read, write authority, change authority, delete authority, and existence authority. In general, the security associated with security processor 12 of the present invention is a hierarchical object-oriented security. The security processor 12 keeps track of a list of users and a list of objects which may comprise screens, programs, files, reports or particular fields within screens. The security processor 12 monitors the requested access of a particular user using the table of objects which are authorized to be accessed by that user. The user definition operation illustrated with reference to FIG. 27 allows an administrator of a system to preclude a whole program and all the objects associated with that program from access by a particular user. In addition, the user can access the security of particular objects in a hierarchical fashion and preclude particular screens or particular fields within screens from access for users.

FIG. 28 represents the object maintenance operation performed under the administration sub-menu 50. The method proceeds from branch point m to a step 220 where all of the objects are listed and the user is presented with several options. The system administrator can proceed to step 222 where particular users can be authorized access to a particular object. The method then proceeds to step 224 where the tables described previously are updated with the new user authorization information. From step 220, the system administrator can also add a new object to the object list in step 226. If a new object is added, the method proceeds to step 228 where the new object is described. The method can also proceed directly from step 222 to step 228 if an existing object description must be edited. One type of object that is added to the object list is new reports formatted using the report writer capability described previously. The report writer program automatically adds any newly formatted

reports to the object list. The system administrator can then authorize new users to access that report in step 222 and step 224 described previously.

The data processing system described herein integrates a sophisticated graphical user interface 18 with an object level security processor 12. In addition, sophisticated bidirectional communication with a printer 30 is utilized to provide for the efficient and secure printing of financial instruments. The operation and maintenance of the integrated system is enhanced through the use of grammar files and parametric-based files to allow for easy configuration and customization of the integrated system.

Although the present invention has been described in detail, it should be understood that various changes, alterations and substitutions can be made to the description of the system described herein without departing from the spirit and scope of the invention which is solely defined by the appended claims.

What is claimed is:

1. A data processing system operable to process financial instruments, comprising:

- a graphical user interface operable to present a plurality of options to a user of the system;
- a data base processor operable to manage a data base of information associated with financial instruments processed by the system;
- a printer operable to print financial instruments responsive to data received from the data base processor, said printer using a magnetic ink character recognition font for selected portions of the financial instruments, and further operable to transmit error codes specifying error conditions encountered during processing of financial instruments; and
- a security processor operable to restrict access to selected functions of the system, the security processor being operable to confirm an identity of a user of the system prior to allowing access to the printer for printing the financial instruments, the security processor being further operable to compare a unique identifier associated with a particular printer, to a stored identifier to confirm the identity of the particular printer and operable to automatically transmit, in response to confirming the identity of the particular printer, a password associated with the particular printer to the printer to gain access to the printer to print the financial instruments after the password is confirmed.

2. The data processing system of claim 1, further comprising:

- a grammar file storage system operable to store at least one grammar file having a plurality of field definitions, the system being operable to use the field definitions within a selected grammar file as textual material for screens presented to the user by the graphical user interface.

3. The data processing system of claim 2, further comprising:

- a first grammar file comprising first field definitions with English language textual material to be used by the graphical user interface; and
- a second grammar file comprising field definitions with foreign language equivalents of the first field definitions, the system being operable to select from the first and second grammar files for use in the graphical user interface in response to a user identification input by a user of the system.

4. The data processing system of claim 1, further comprising:

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a parameter storage system operable to store parameter values used by the system during the processing of the financial instruments.

5. The data processing system of claim 1, further comprising:

a help processor operable to present to the user textual material providing guidance in the operation of the system, the help processor being operable to select and access a particular help file from a plurality of help files in response to a user identification code associated with a particular user of the system.

6. The data processing system of claim 1, further comprising:

a communications processor operable to create and manage a communications path between the system and an external host computer system, the communications processor being operable to transmit data from the data base to the host computer system and to receive information transmitted from the host computer system.

7. The data processing system of claim 1, wherein the printer is operable to use a magnetic ink character recognition font to print selected characters on the financial instruments, and wherein the printer must receive the password associated with the particular printer prior to accessing the magnetic ink character recognition font.

8. The data processing system of claim 1, further comprising:

a report writer operable to retrieve information from the data base and format the information into reports, the report writer being further operable to output the formatted reports to the printer.

9. The data processing system of claim 1, further comprising a fee calculation system operable to calculate fees associated with the financial instruments processed by the system, the security processor being operable to monitor the processing of fees such that authorization and documentation is required before the calculated fees can be waived or adjusted.

10. The data processing system of claim 1, wherein the printer is further operable to request the password.

11. A data processing system for processing data using a personal computer, comprising:

an execution control processor comprising a data base processor operable to manage a data base of information, and a security processor operable to receive user identifications from users of the system and to control access of users to selected functions of the system;

a laser printer bidirectionally coupled to the execution control processor, said laser printer including a secure font that can be accessed to print documents only upon receiving and confirming a password associated with a particular printer, said password being automatically transmitted from the execution control processor in response to confirmation of the identity of the particular printer using a unique identifier associated with the particular printer,

a graphical user interface operable to present screens of information to users of the system, the screens including fields containing textual material;

a grammar file storage system operable to store at least one grammar file containing field definition data operable to specify the textual material to be presented to the user through the graphical user interface; and

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the execution control processor being operable to select and use a grammar file stored by the grammar file storage system associated with a particular user of the system in response to the user identification input by the particular user of the system, the selected grammar file uniquely specifying the textual material to be presented to the particular user, the execution control processor being further operable to allow editing of the field definition data in the grammar file according to the needs of a particular installation of the data processing system and the particular user, to thereby customize the grammar file storage system associated with the particular installation.

12. The data processing system of claim 11, wherein the security processor is operable to direct the presentation of options available to the user through the graphical user interface in response to the user identification input by the particular user of the system.

13. The data processing system of claim 11, wherein the secure font comprises a magnetic ink character recognition font, and wherein the printer is operable to transmit information identifying printer errors to the execution control processor in response to an occurrence of errors during the operation of the printer.

14. A method for processing financial instruments using a data processing system, comprising the steps of:

receiving a user identification from a user of the system; receiving information associated with a financial instrument input through a graphical user interface; storing the information associated with the financial instrument in a data base;

comparing a unique identifier associated with a particular printer to a stored identifier to confirm an identity of the particular printer;

automatically transmitting, in response to confirming the identity of the particular printer, a security code associated with the particular printer to the printer to access a secure font;

transmitting the information associated with the financial instrument to the printer after the security code is confirmed;

printing the financial instrument using the secure font and the information associated with the financial instrument; and

receiving print status information from the printer.

15. The method of claim 14, further including the steps of: selecting a grammar file associated with a particular user in response to the user identification; and

loading the graphical user interface with textual material from the selected grammar file.

16. The method of claim 14, further including the steps of: calculating a fee associated with the processing of a financial instrument;

displaying the calculated fee to the user of the system; displaying a list of selectable reasons for adjusting the calculated fee to the user of the system;

receiving a security authorization code and information indicating a reason for adjusting the calculated fee from the user; and

storing information indicating an adjusted fee and the information indicating a reason for adjusting the calculated fee.

17. The method of claim 14, further including the steps of:

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establishing a communication path between the data processing system and a host computer system; and transmitting information associated with transactions processed by the data processing system to the host computer system through the communication path.

18. The method of claim 14, further including the steps of: storing a plurality of help files comprising textual material for presentation to a user of the system;

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selecting one of the plurality of help files in response to the user identification received from the user; and displaying textual material from the selected help file upon receiving a request from the user associated with the user identification.

19. The method of claim 14, further including the step of receiving a password request from the printer.

* * * * *



US006343279B1

(12) **United States Patent**
Bissonette et al.

(10) **Patent No.:** **US 6,343,279 B1**
(45) **Date of Patent:** **Jan. 29, 2002**

(54) **SYSTEM INTEGRATING CREDIT CARD TRANSACTIONS INTO A FINANCIAL MANAGEMENT SYSTEM**

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(73) Assignee: **American Management Systems, Inc.**, Fairfax, VA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/140,795**

(22) Filed: **Aug. 26, 1998**

(51) Int. Cl.⁷ **G06F 17/60**

(52) U.S. Cl. **705/41; 705/30; 705/40; 705/44; 235/380**

(58) Field of Search **705/40, 41, 44, 705/16, 17, 35, 39; 235/380, 440**

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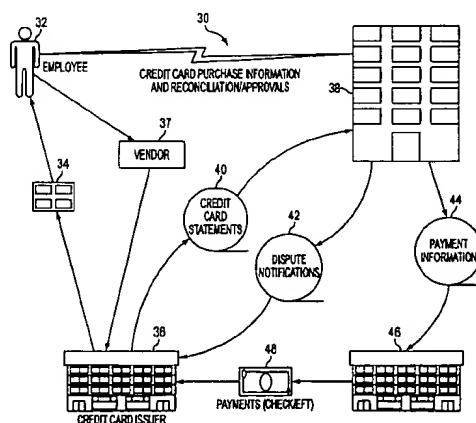
Primary Examiner—Vincent Millin

Assistant Examiner—Charles R. Kyle

(57) **ABSTRACT**

A system integrates credit card transactions into a financial management system used by a company to track and control budgets, etc. The system provides the controls and accounting for credit card transactions found for other types of transactions within the financial management system. The invention limits the card transactions using various limits not available to a credit card issuer and ensures that the transactions comply the financial system controls. The transactions can be obligated prior to or during the actual transaction with the bank and thereby subjected to the controls of the financial management system. Obligated transactions can be authorized for immediate payment. The invention provides for the complete reconciliation of the credit card transactions with bank records after the transactions occur using the obligation function to capture the transaction before it occurs, even the transactions that are immediately paid. The system reconciles the transactions recorded by the bank with those recorded in the financial system and updates budget, plan, project, and ledger entries accordingly. The system also allows cardholders to identify disputes and track the correspondence with the card issuer over the dispute.

30 Claims, 23 Drawing Sheets



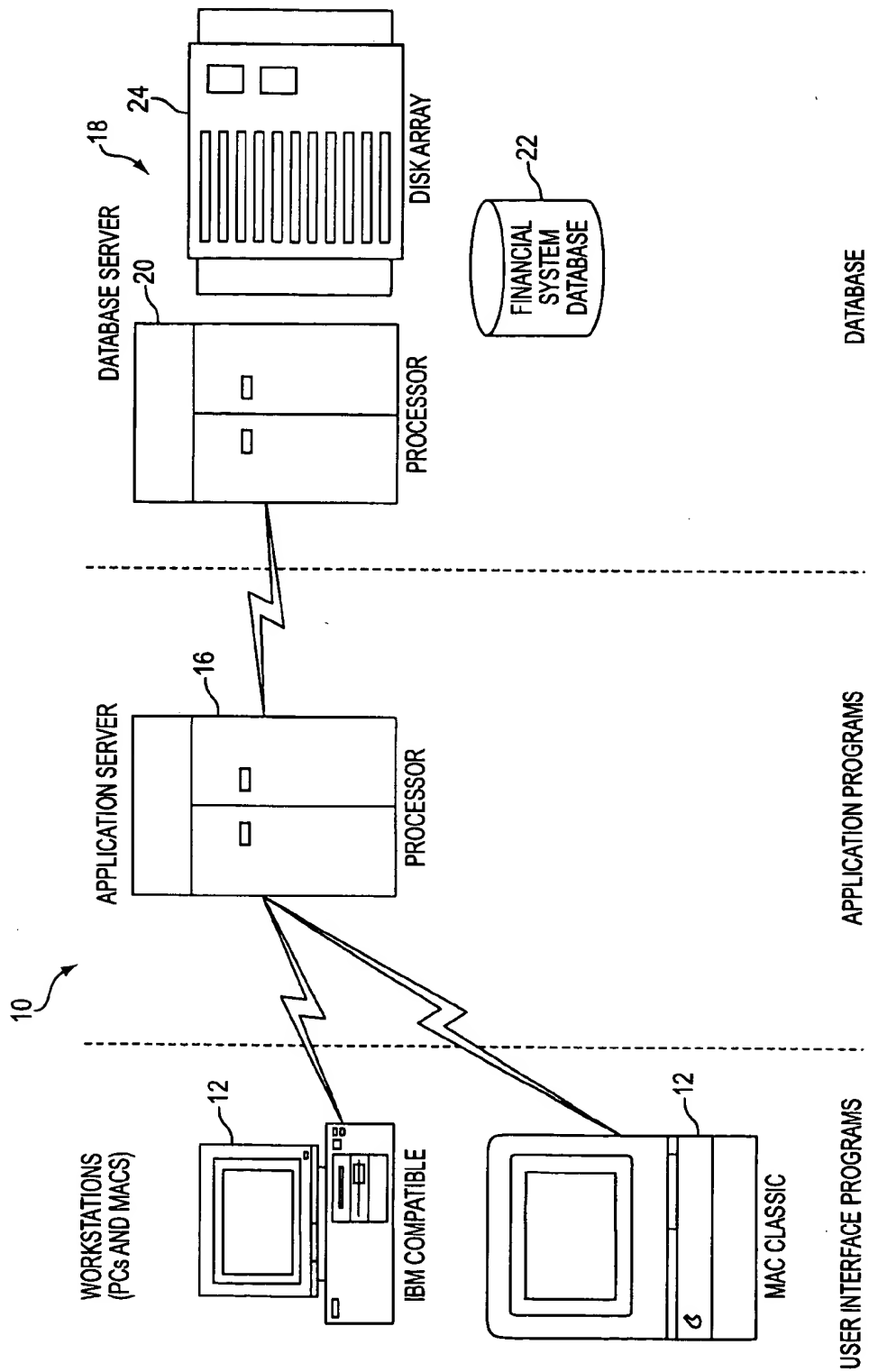


FIG. 1

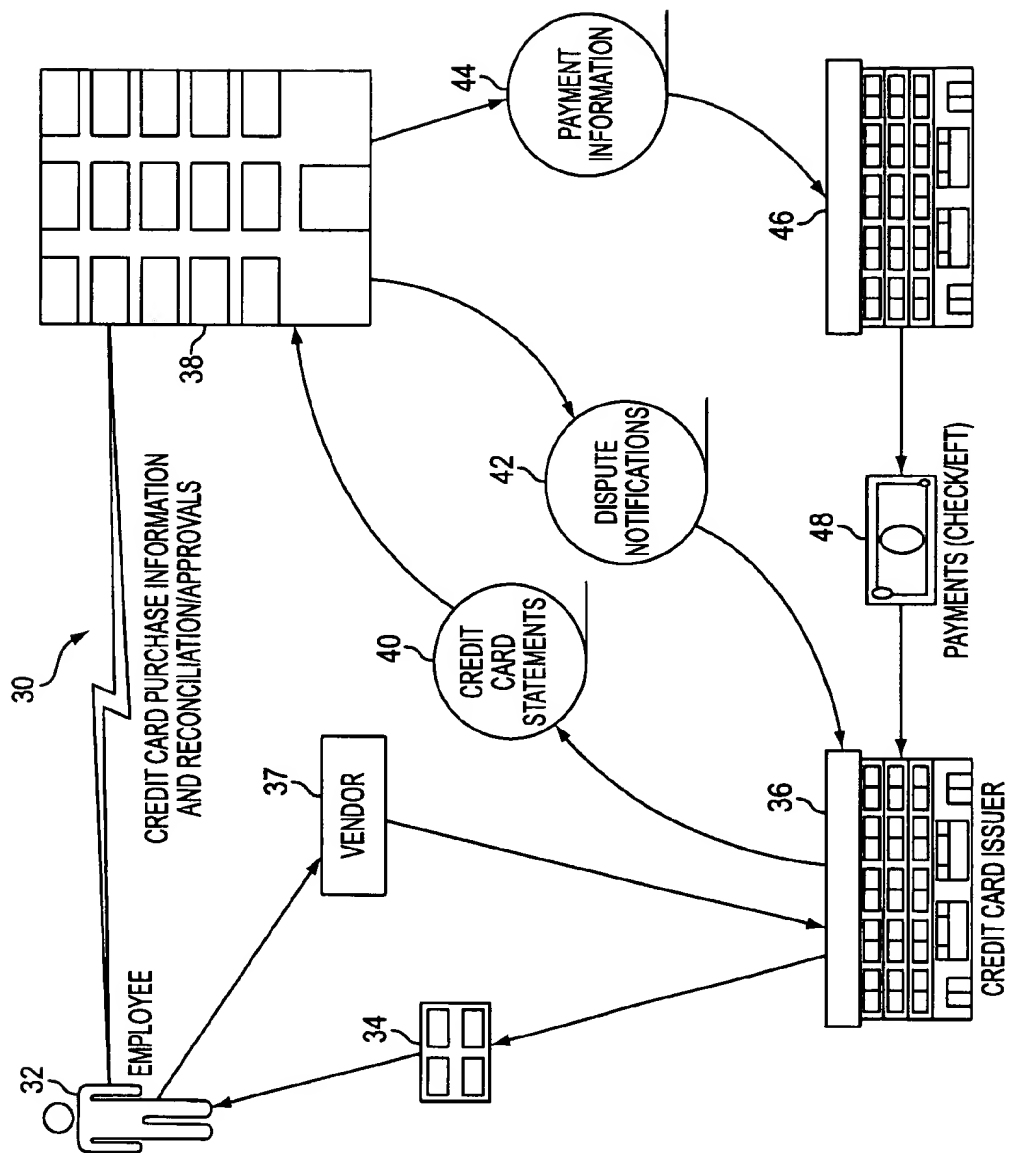


FIG. 2

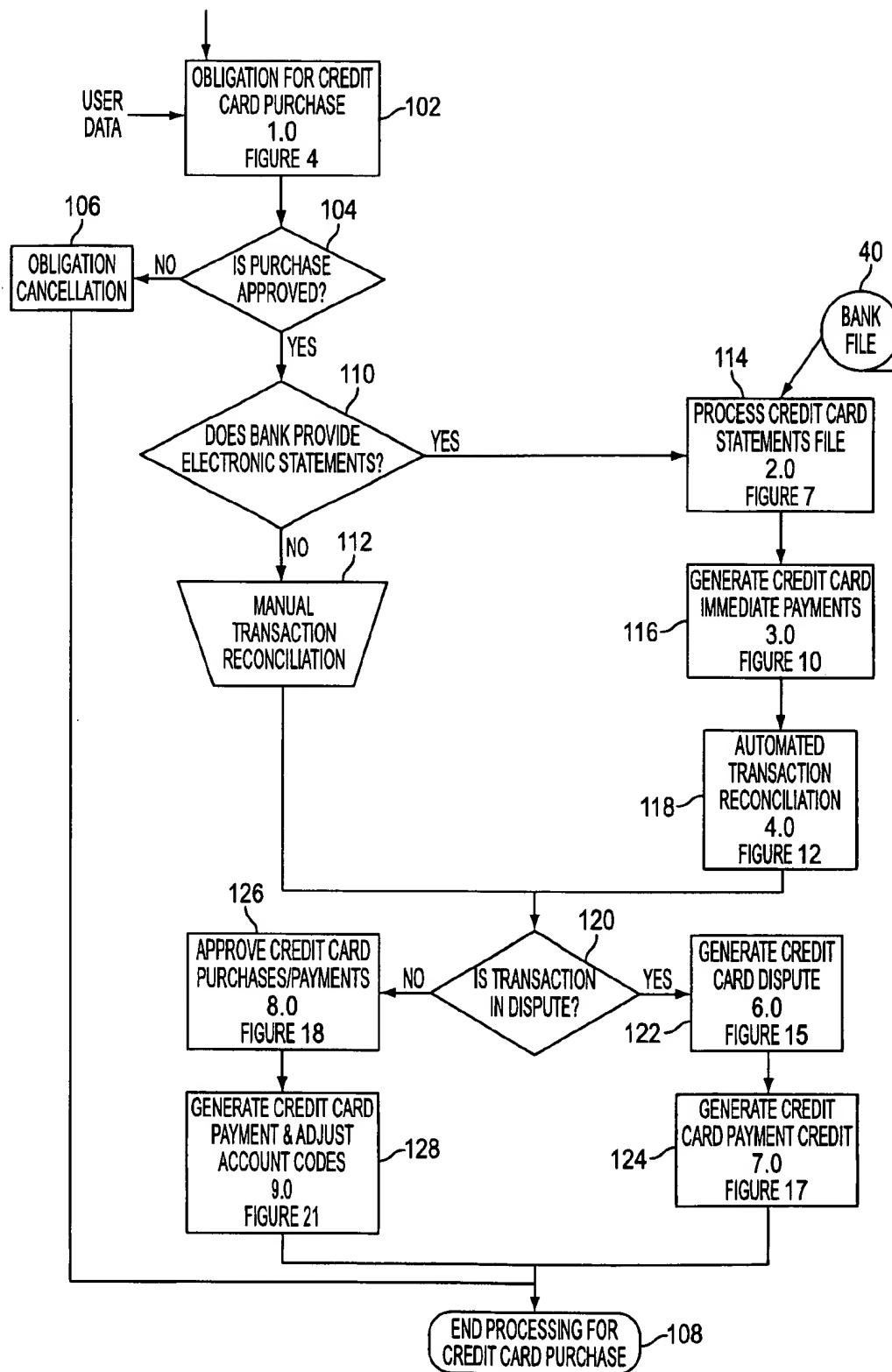


FIG. 3

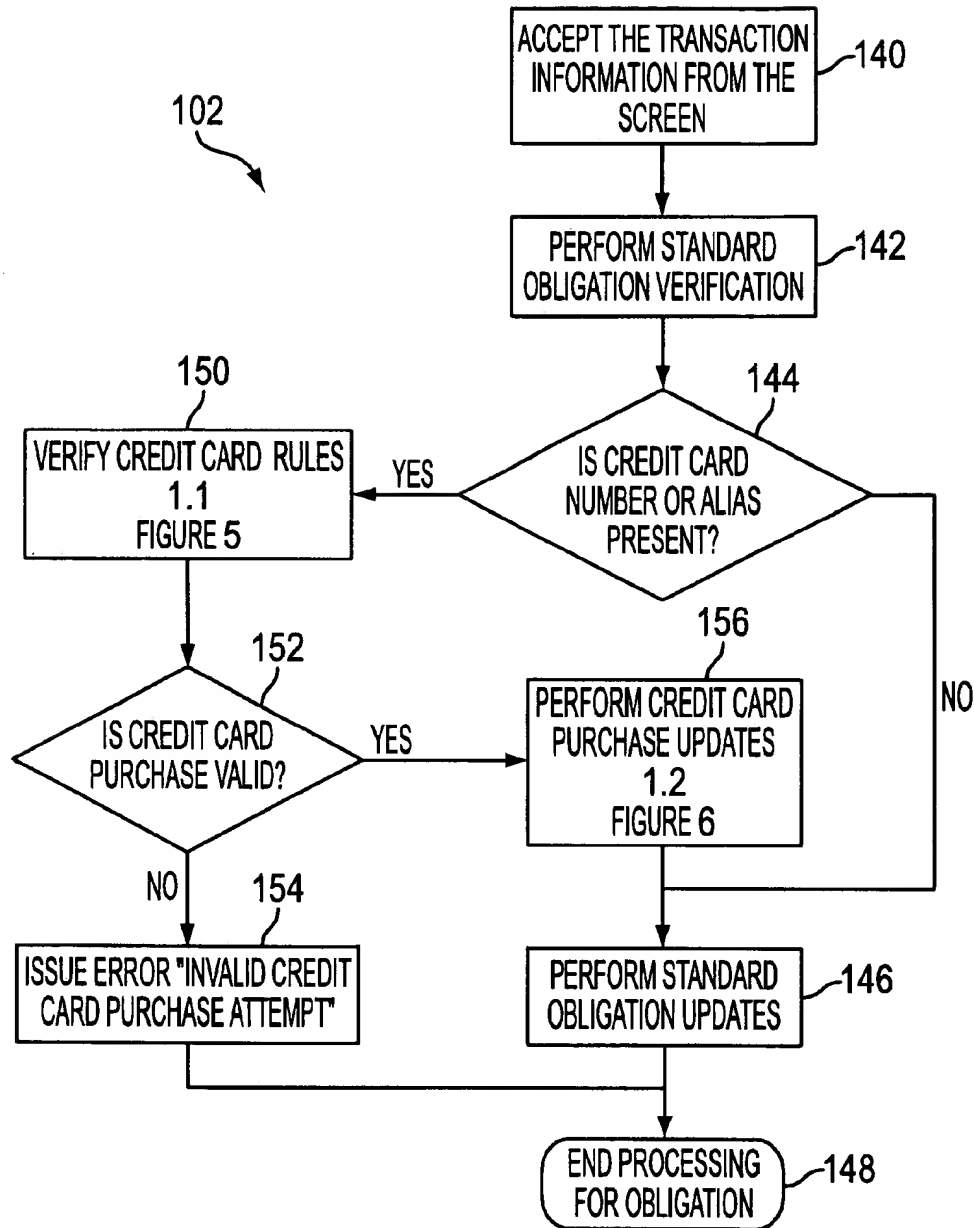
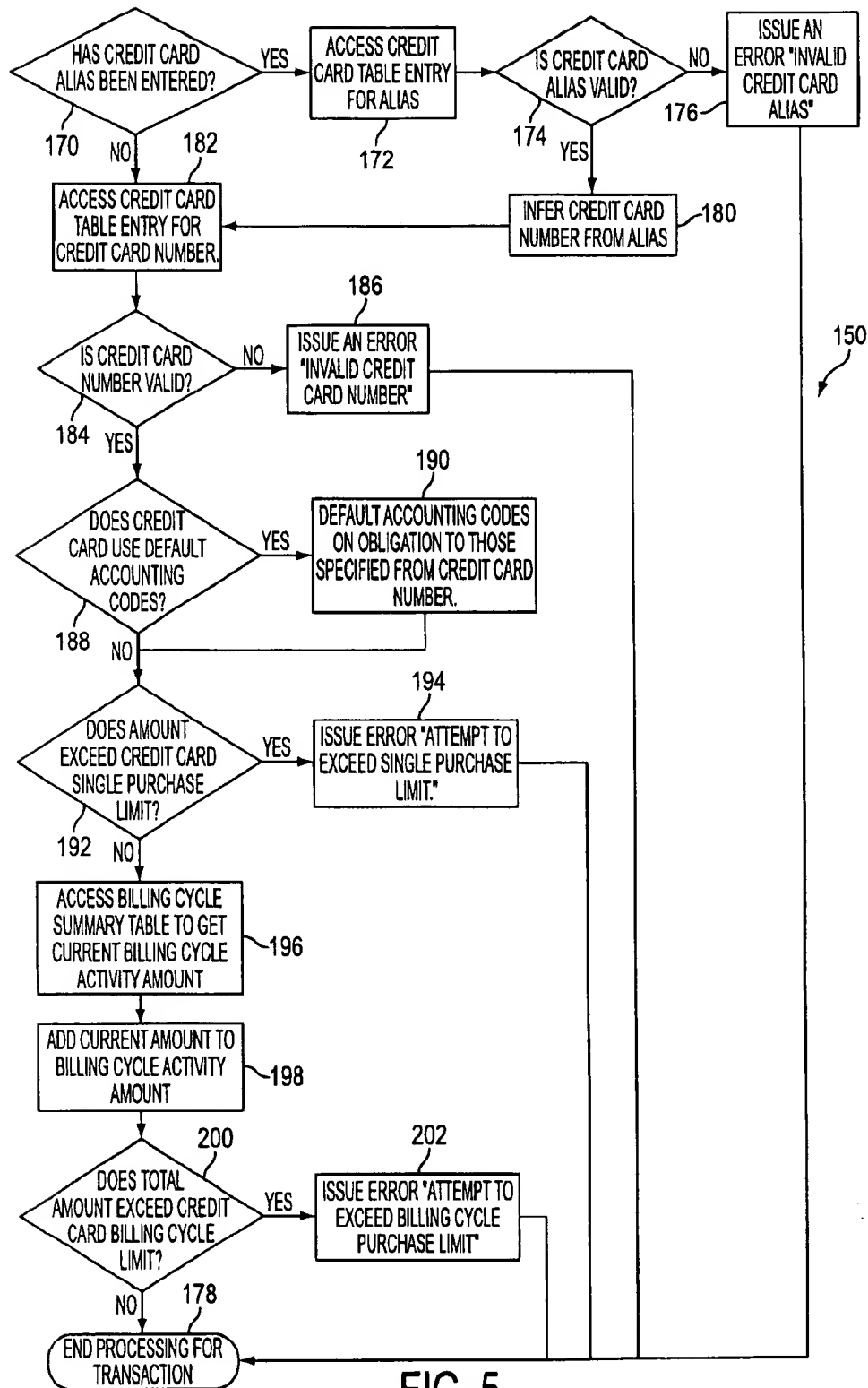


FIG. 4



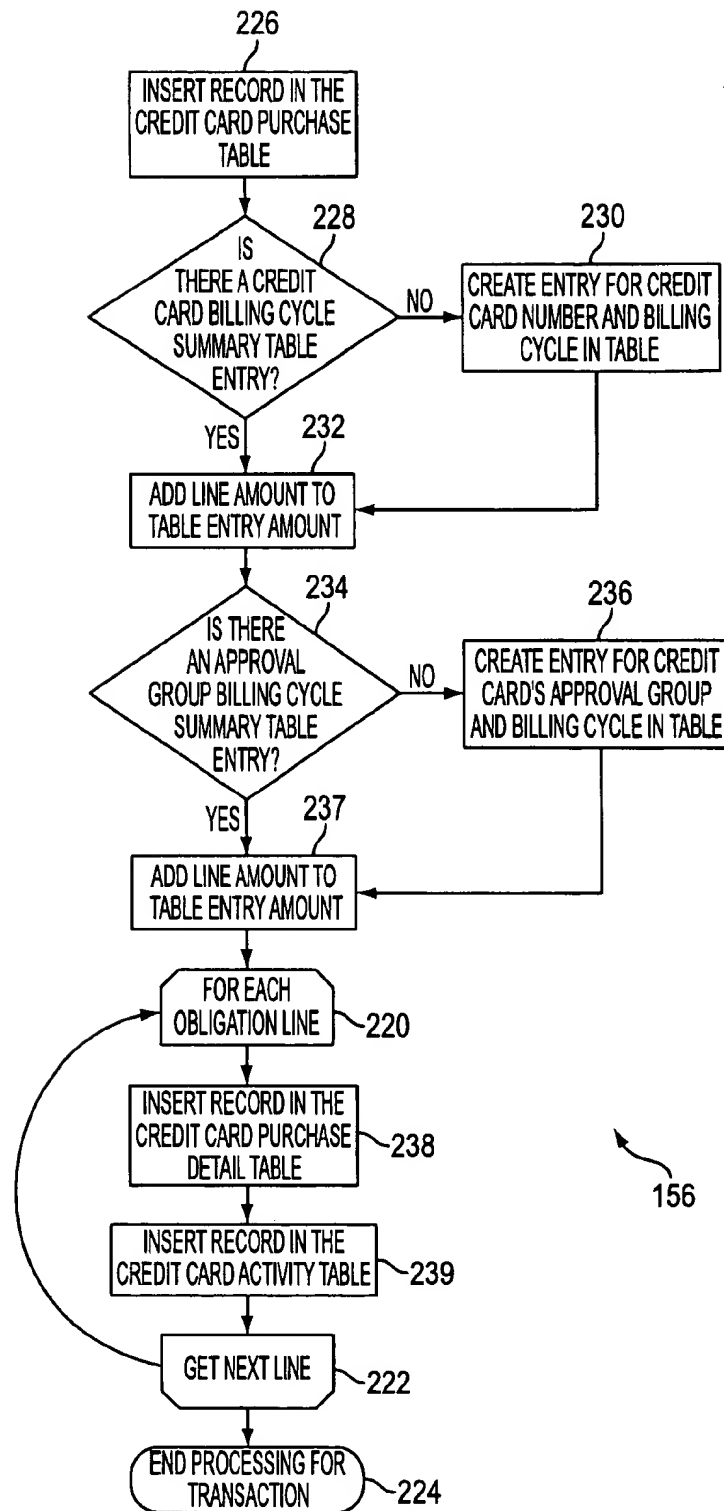


FIG. 6

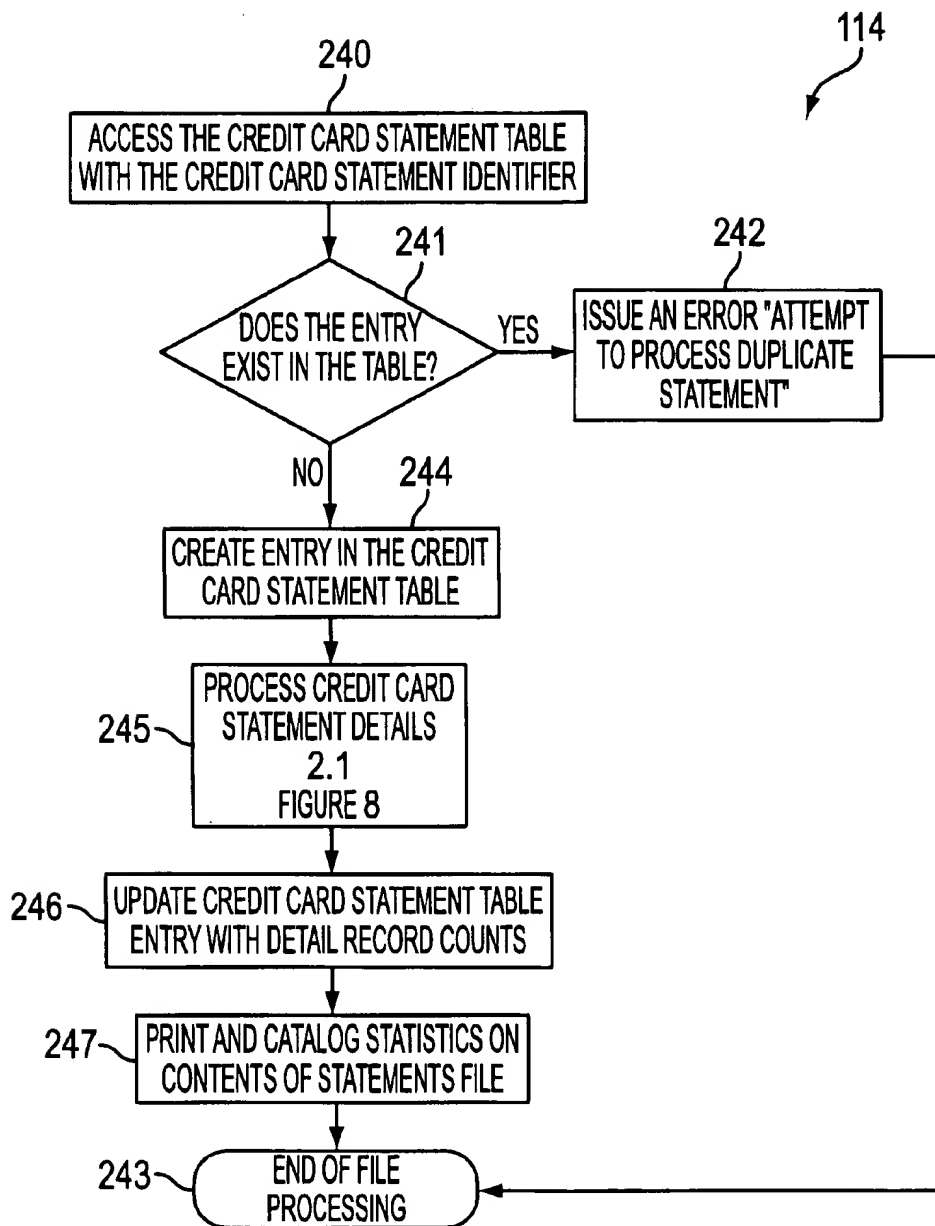


FIG. 7

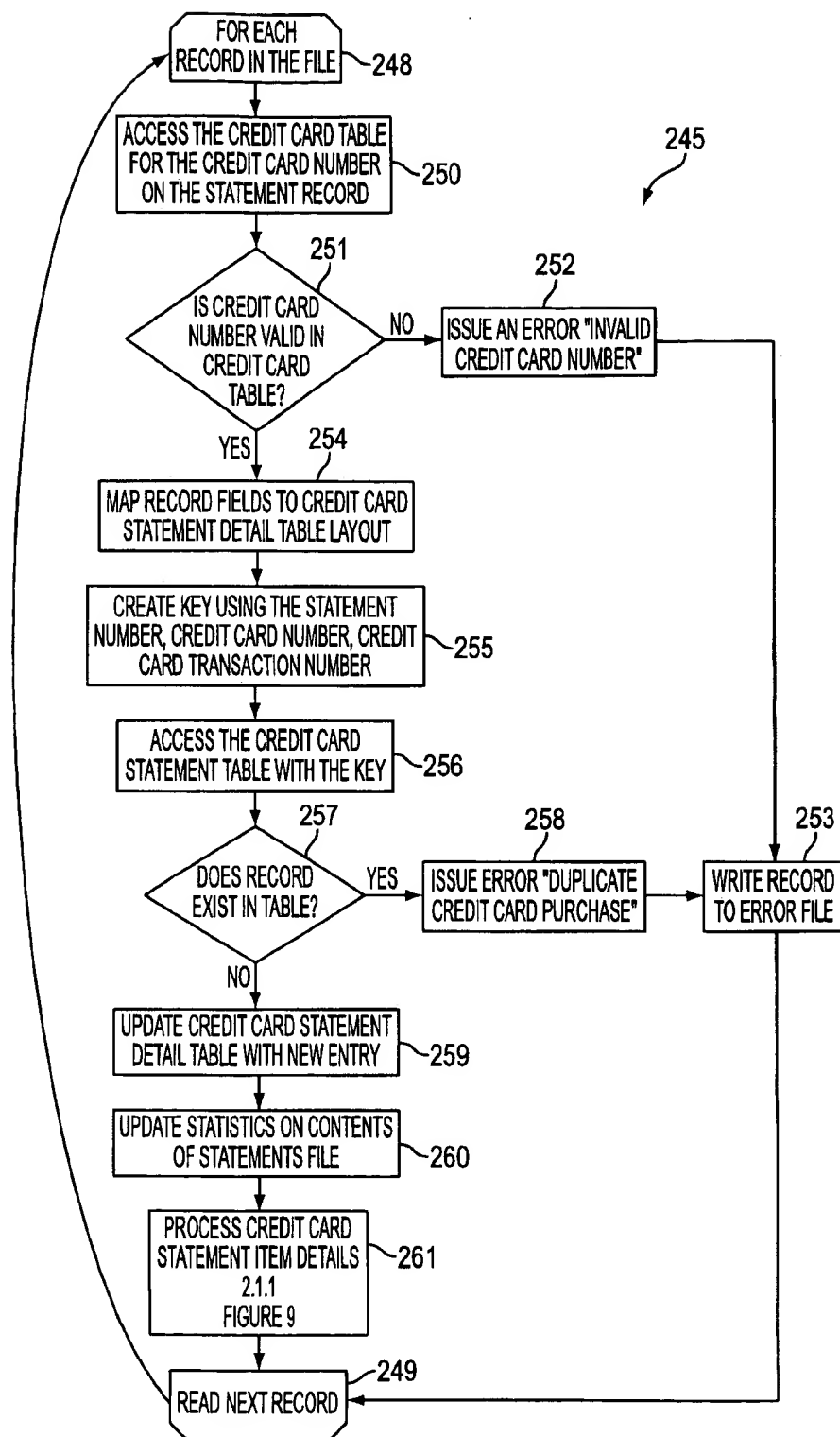


FIG. 8

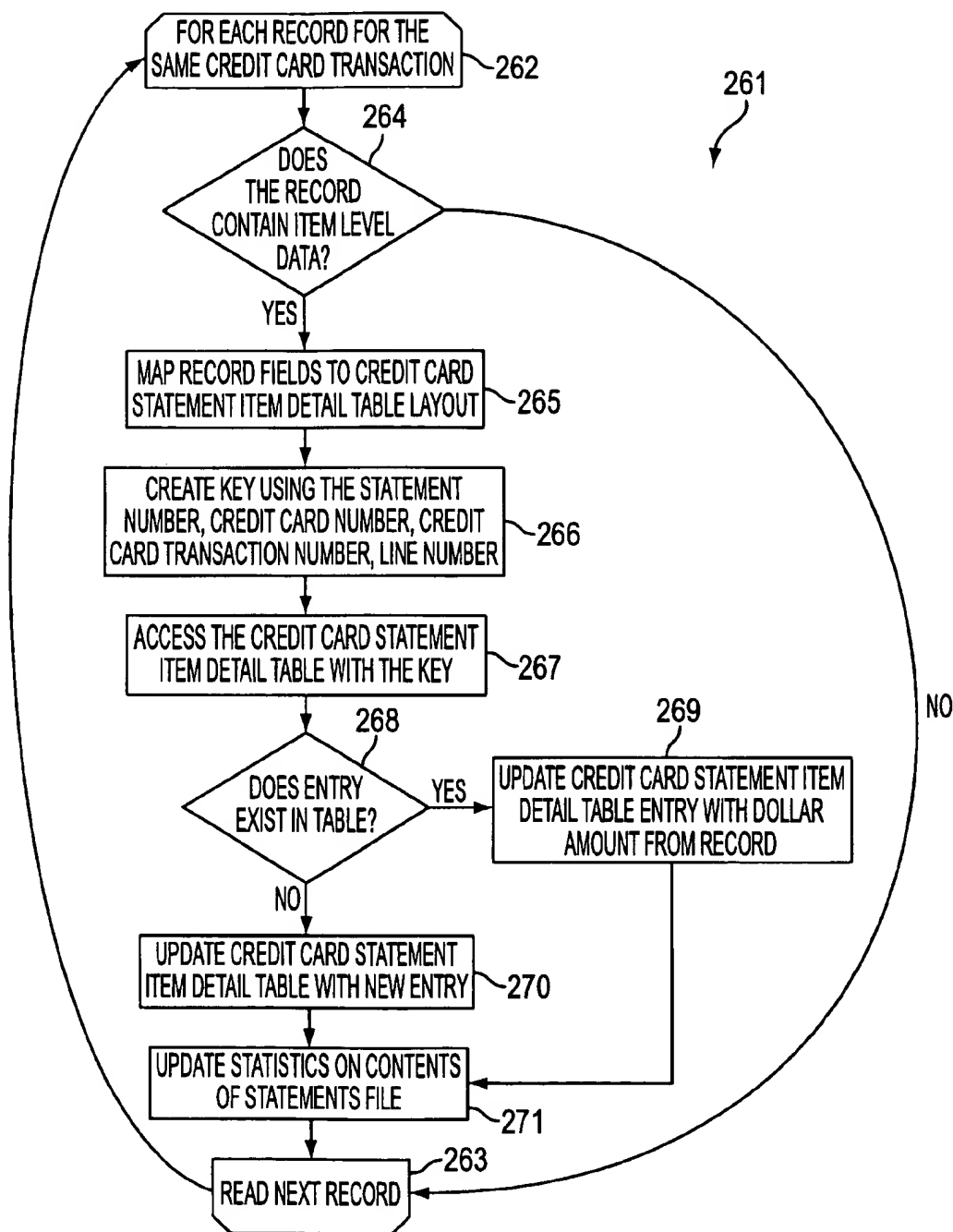


FIG. 9

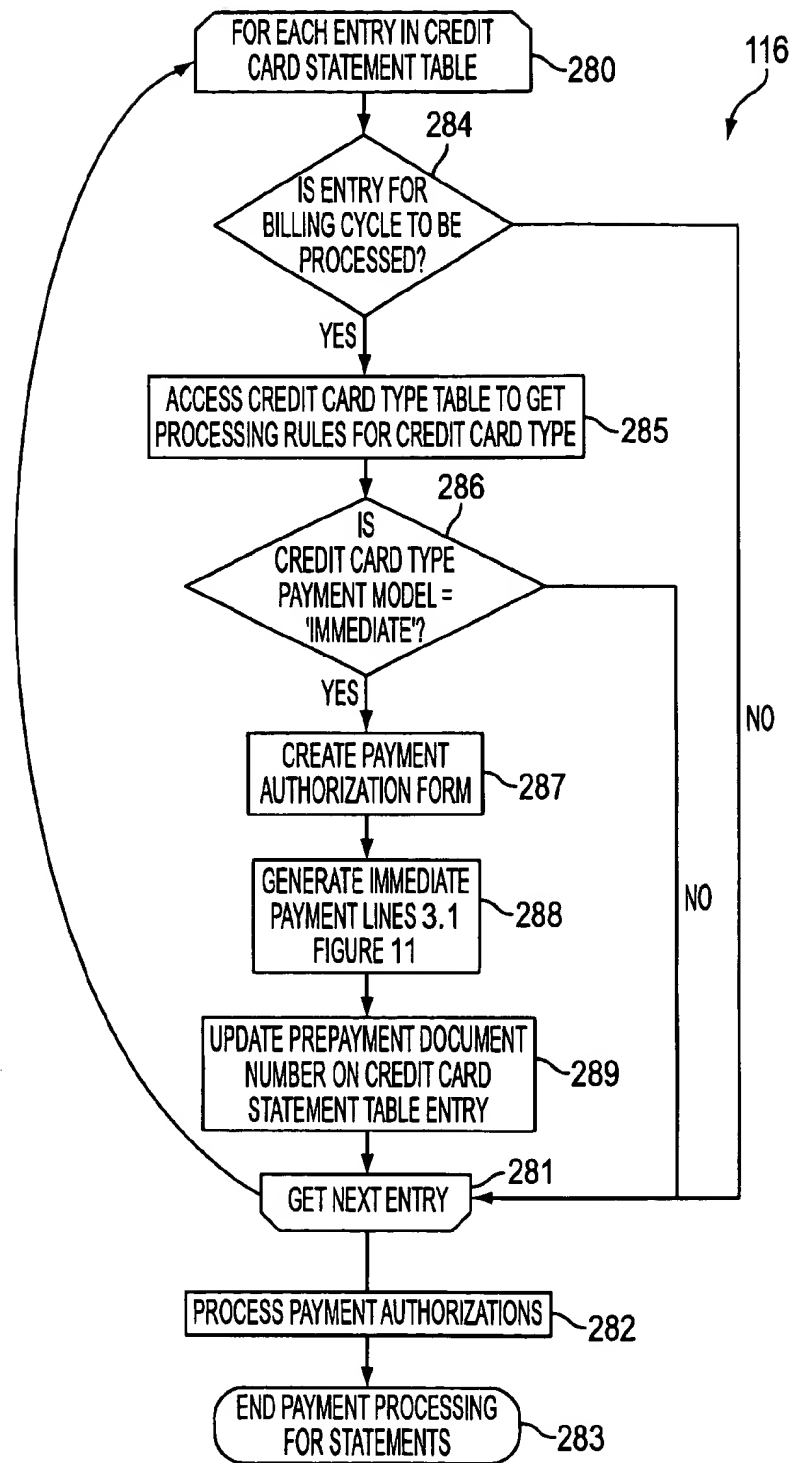


FIG. 10

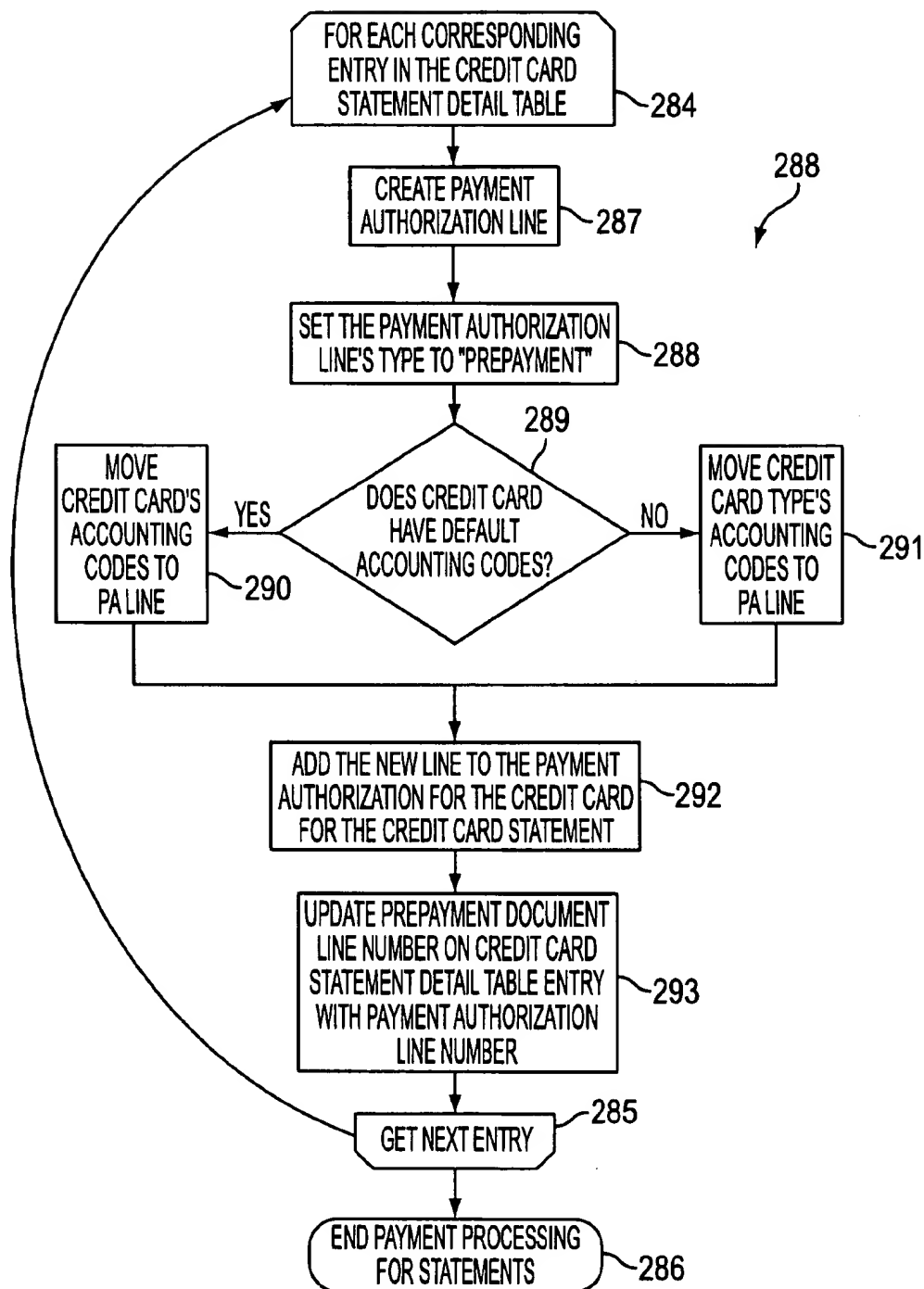


FIG. 11

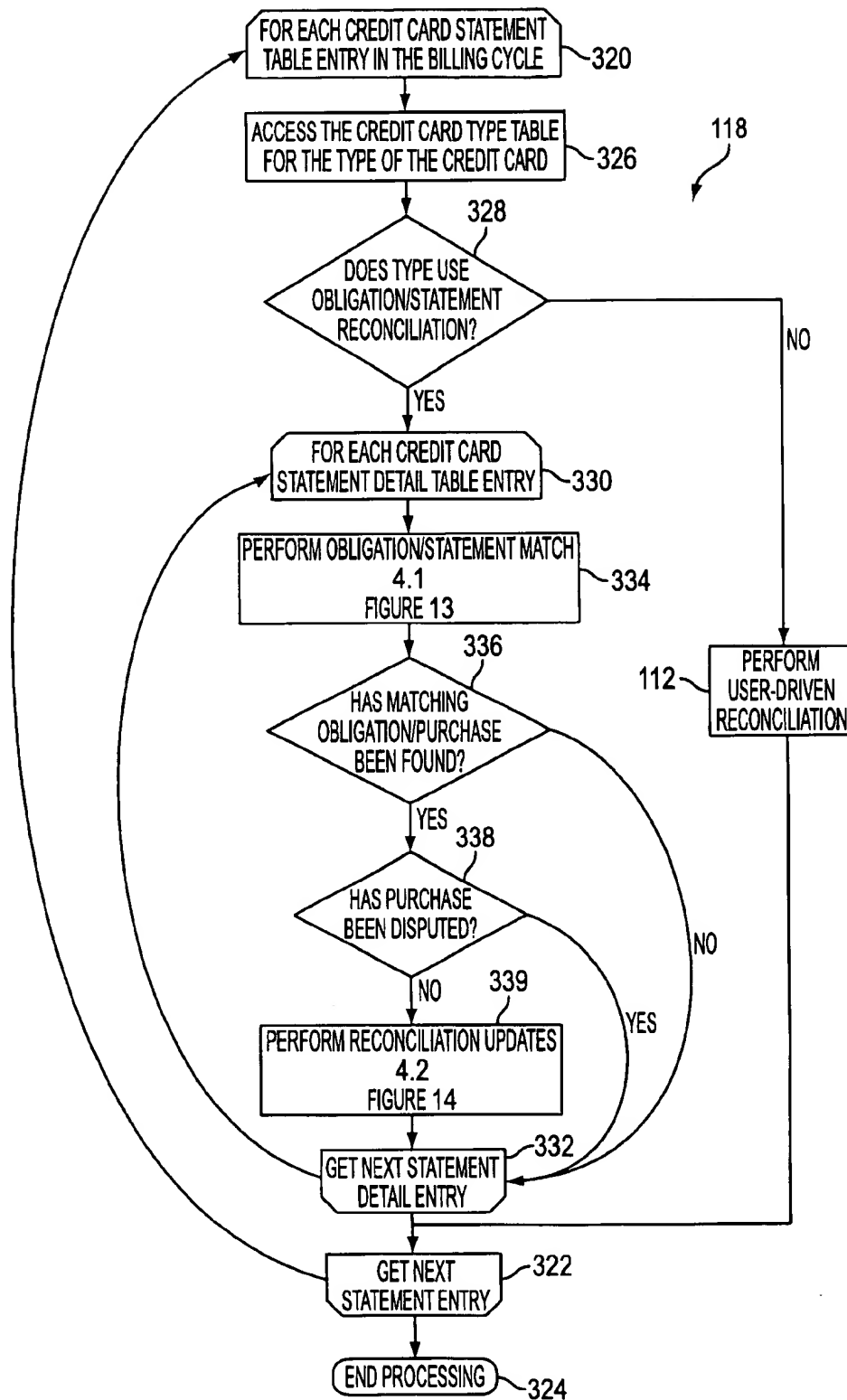


FIG. 12

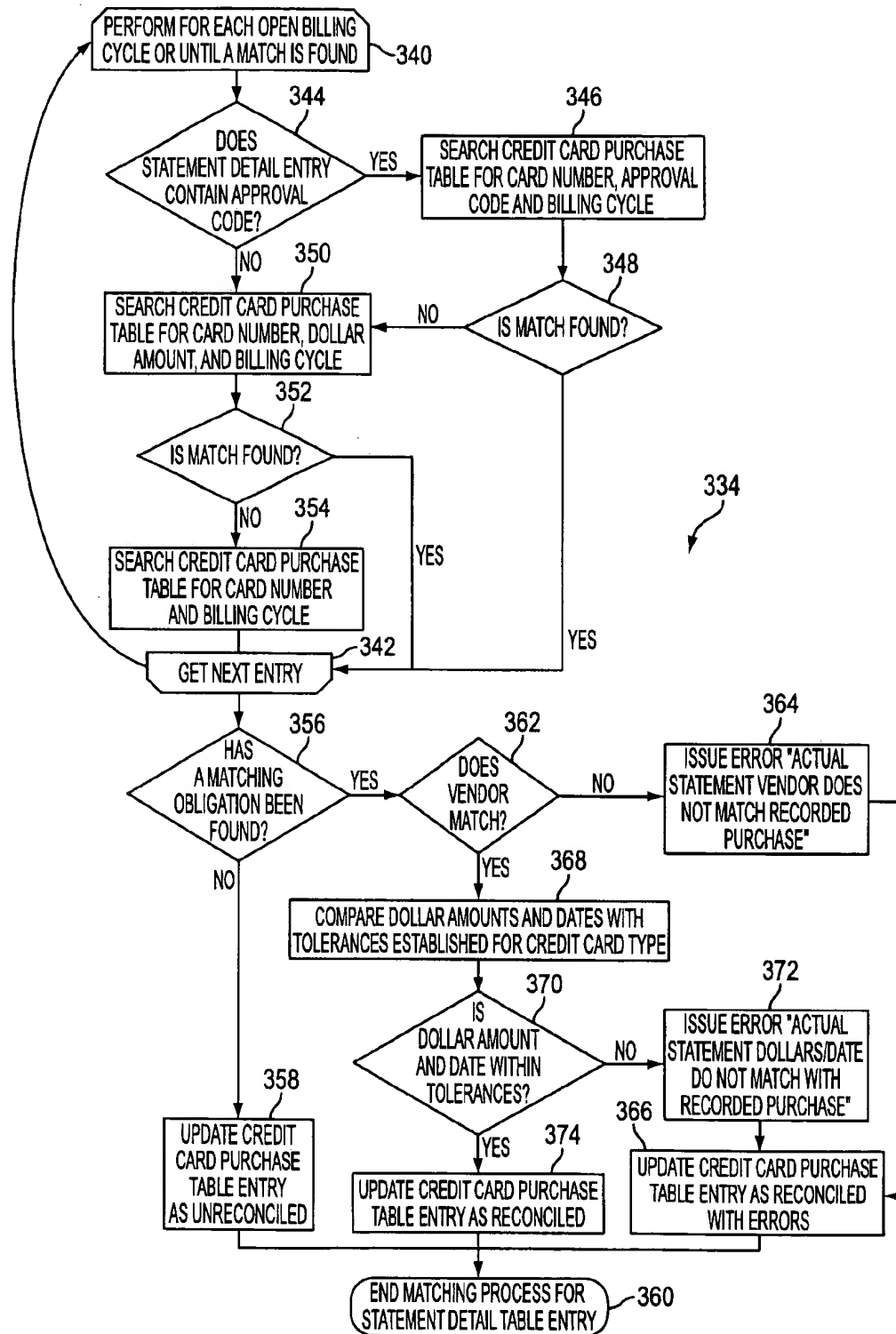


FIG. 13

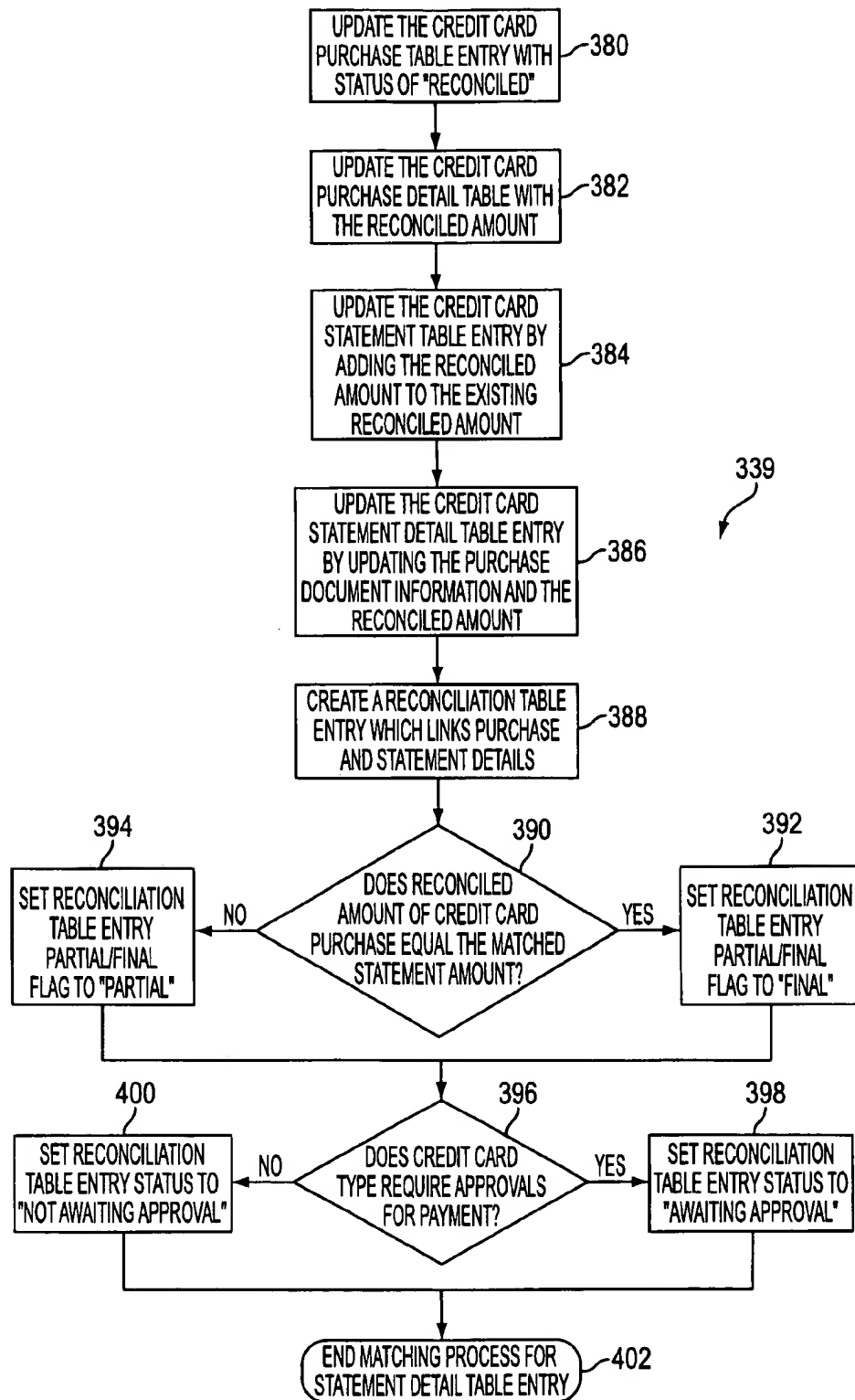


FIG. 14

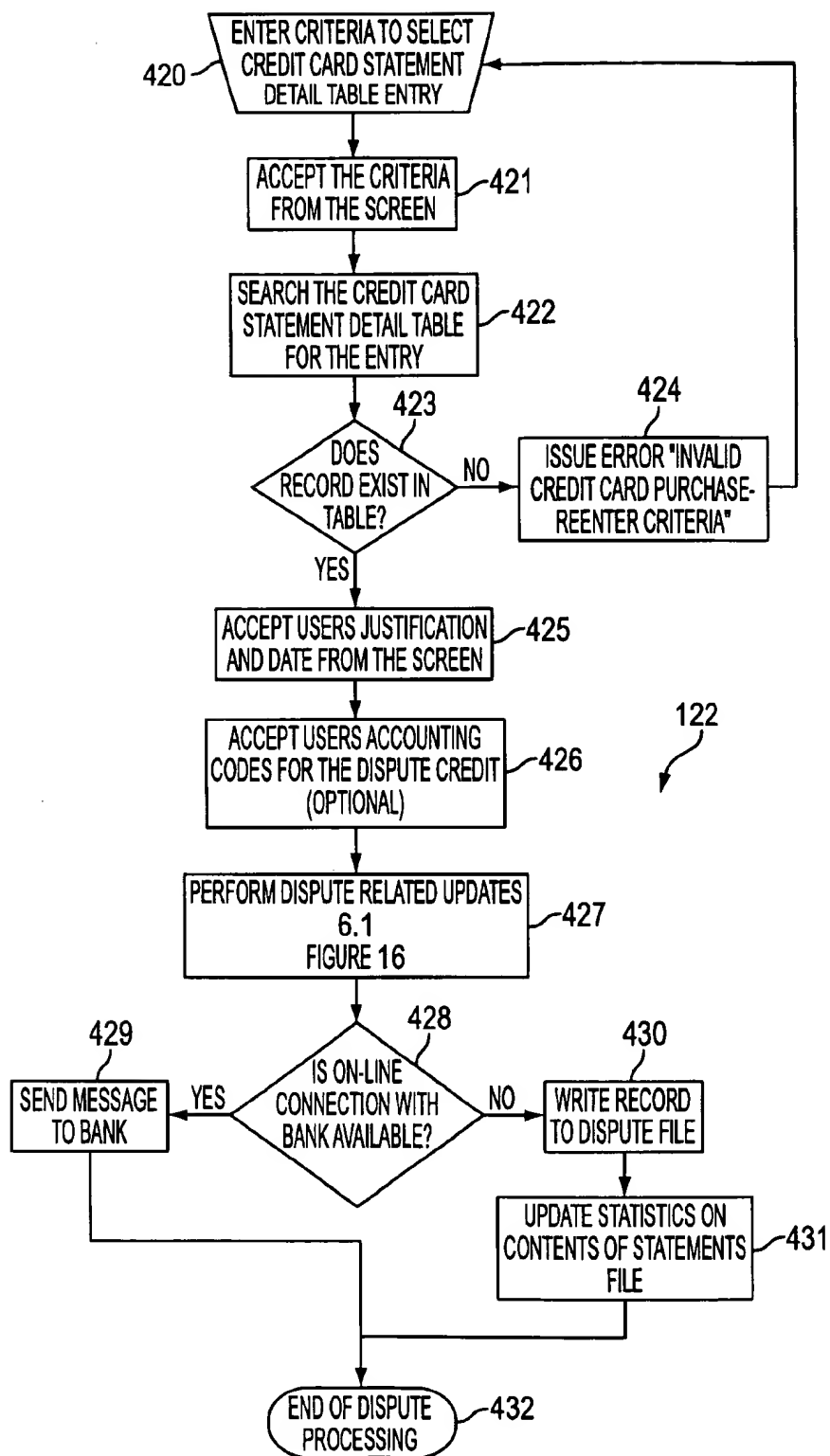


FIG. 15

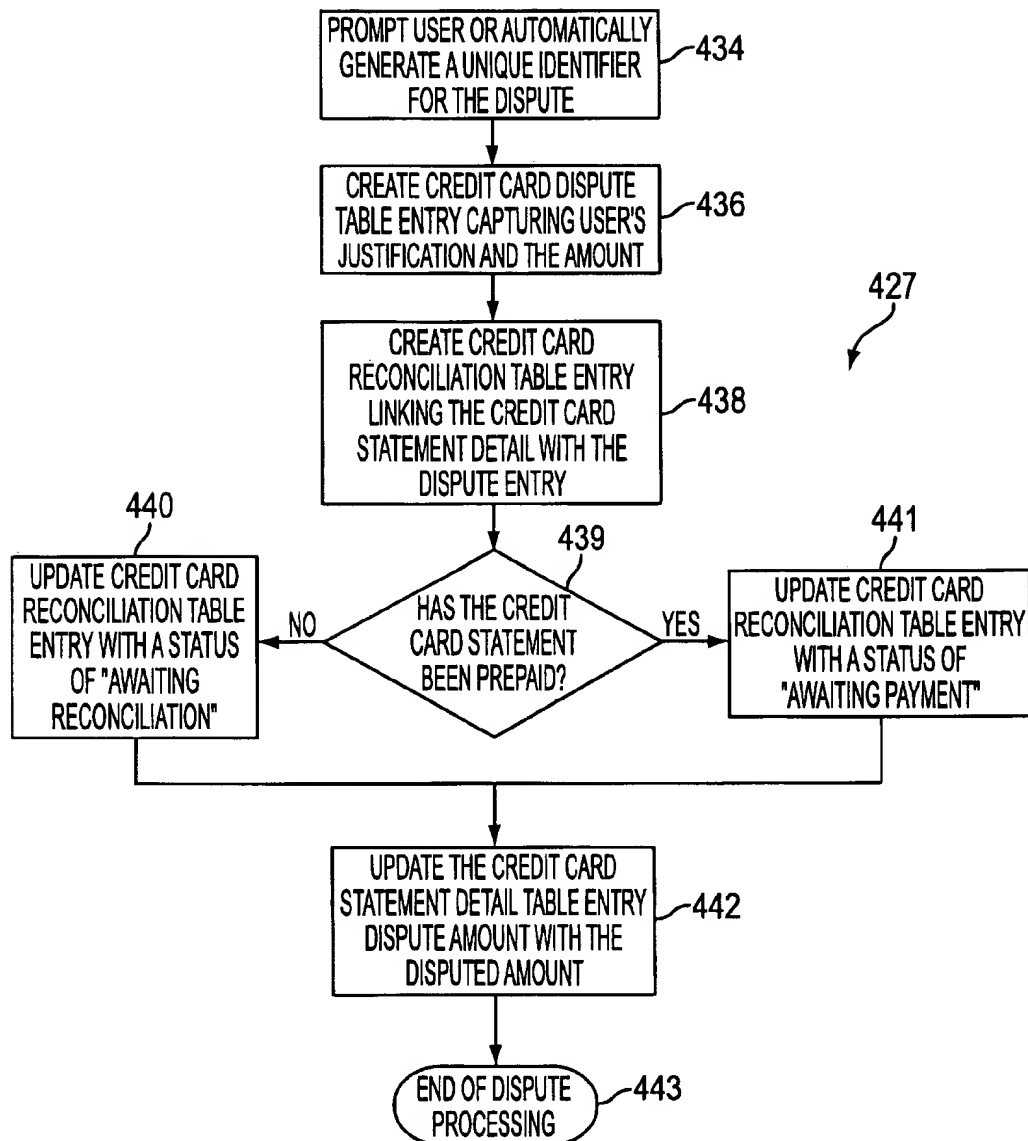


FIG. 16

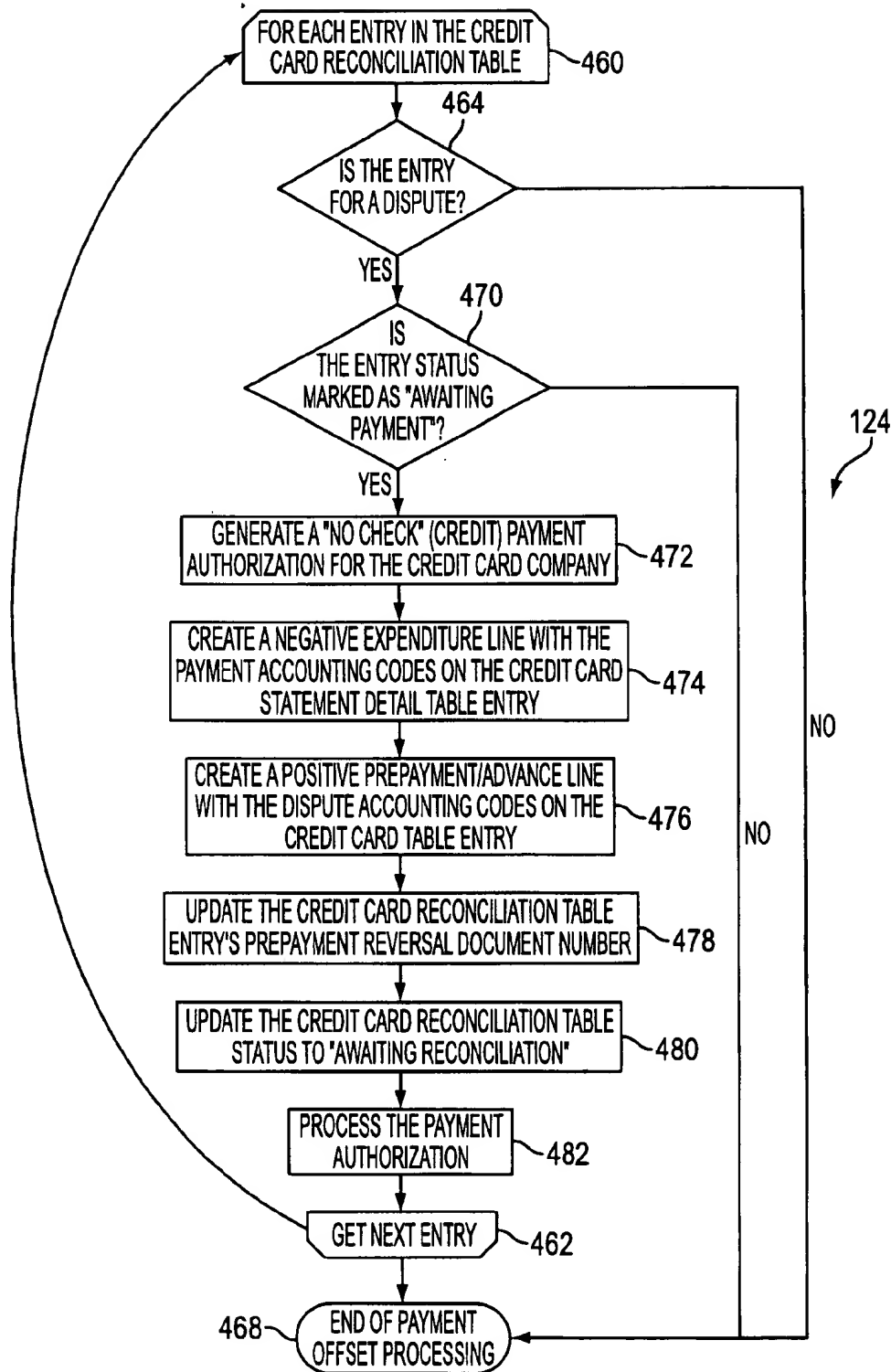


FIG. 17

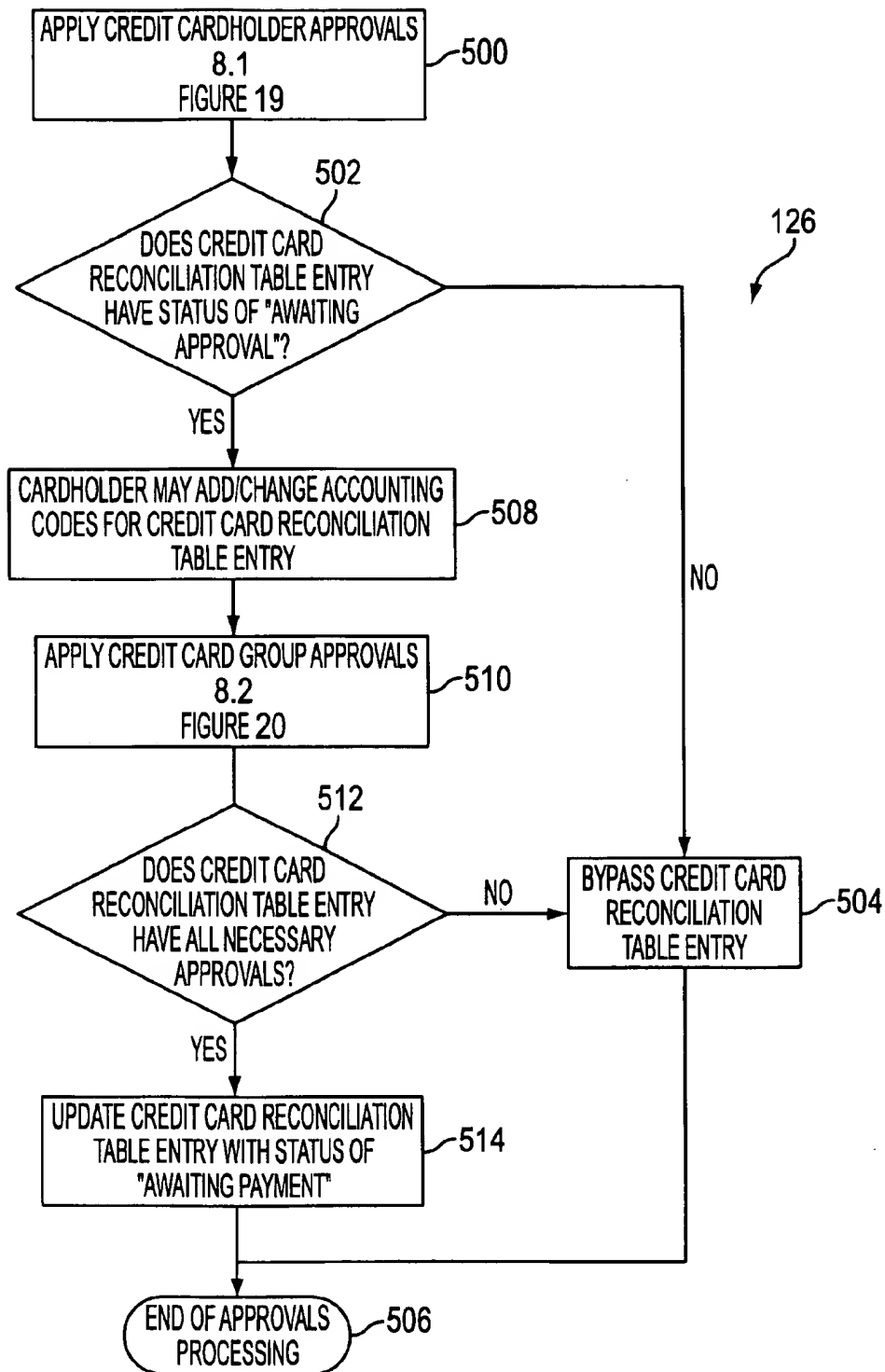


FIG. 18

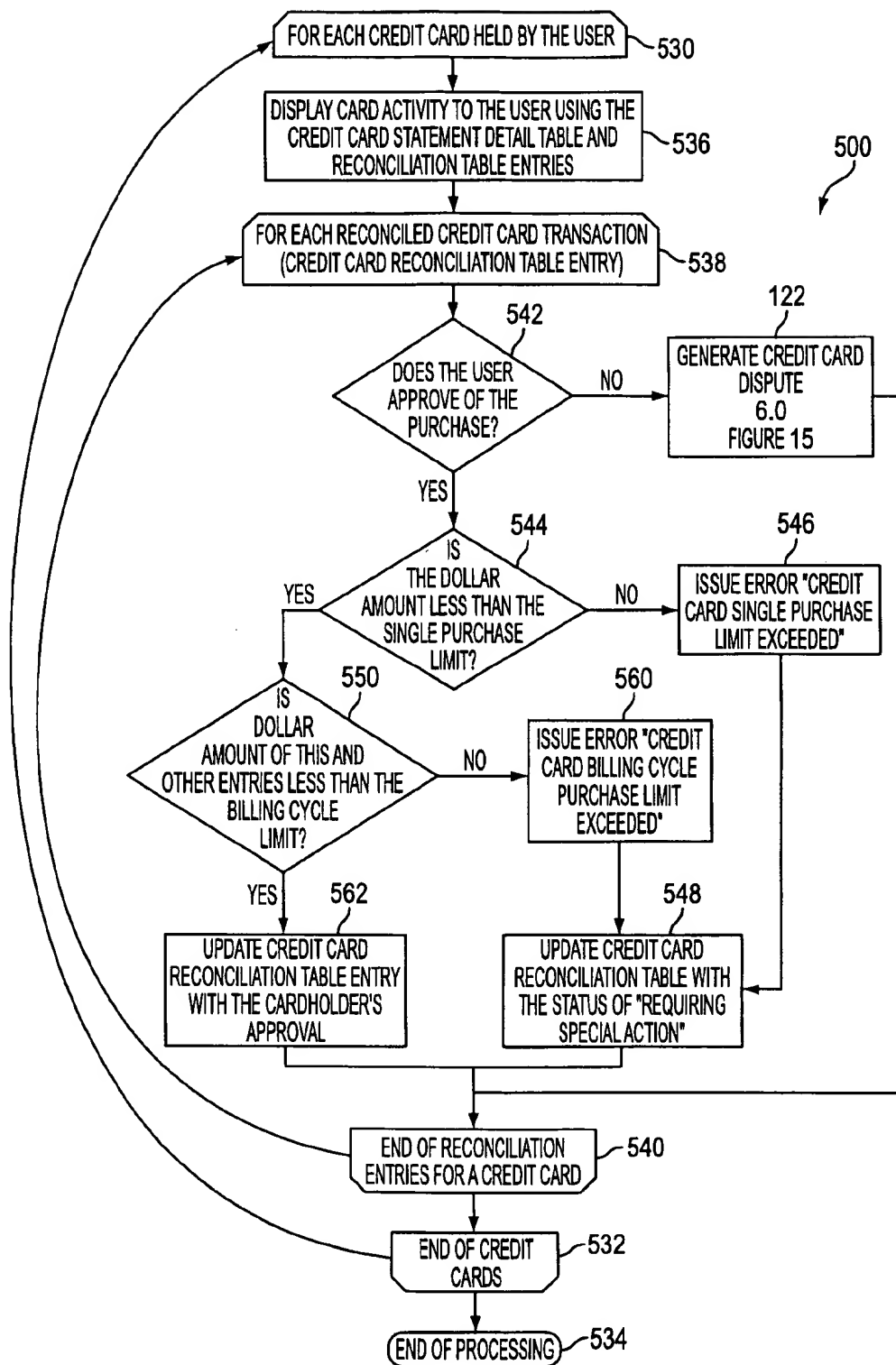
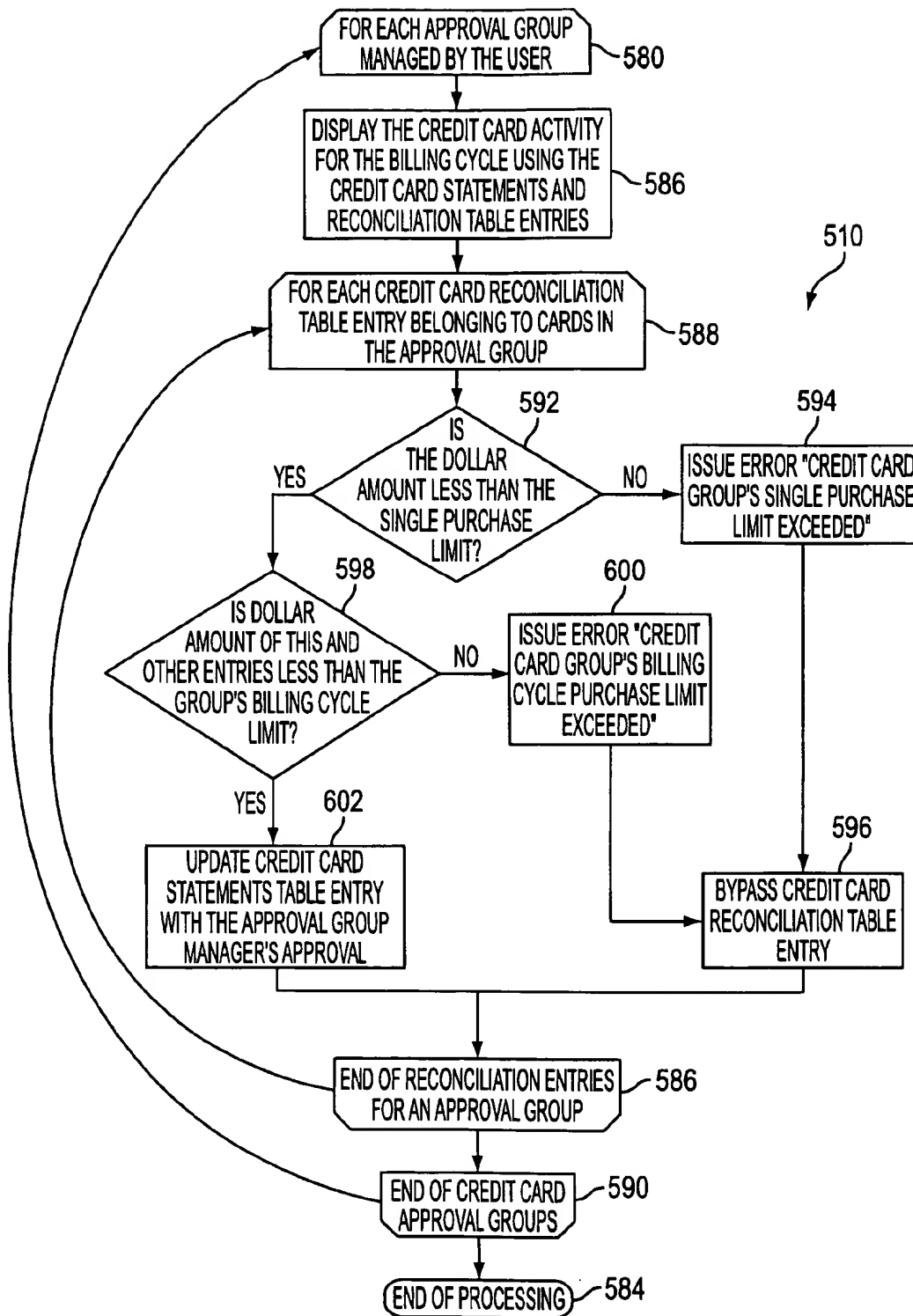


FIG. 19



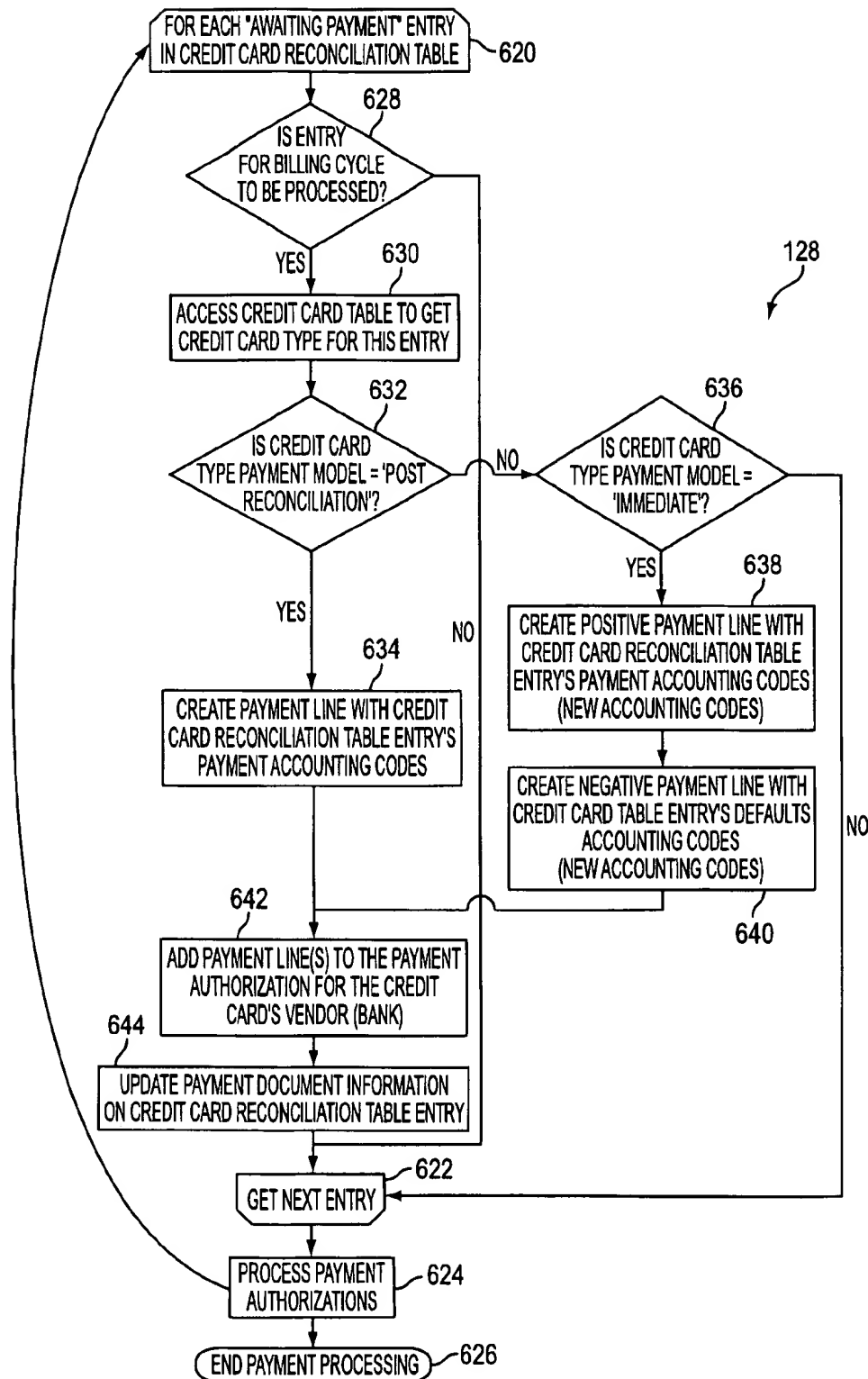


FIG. 21

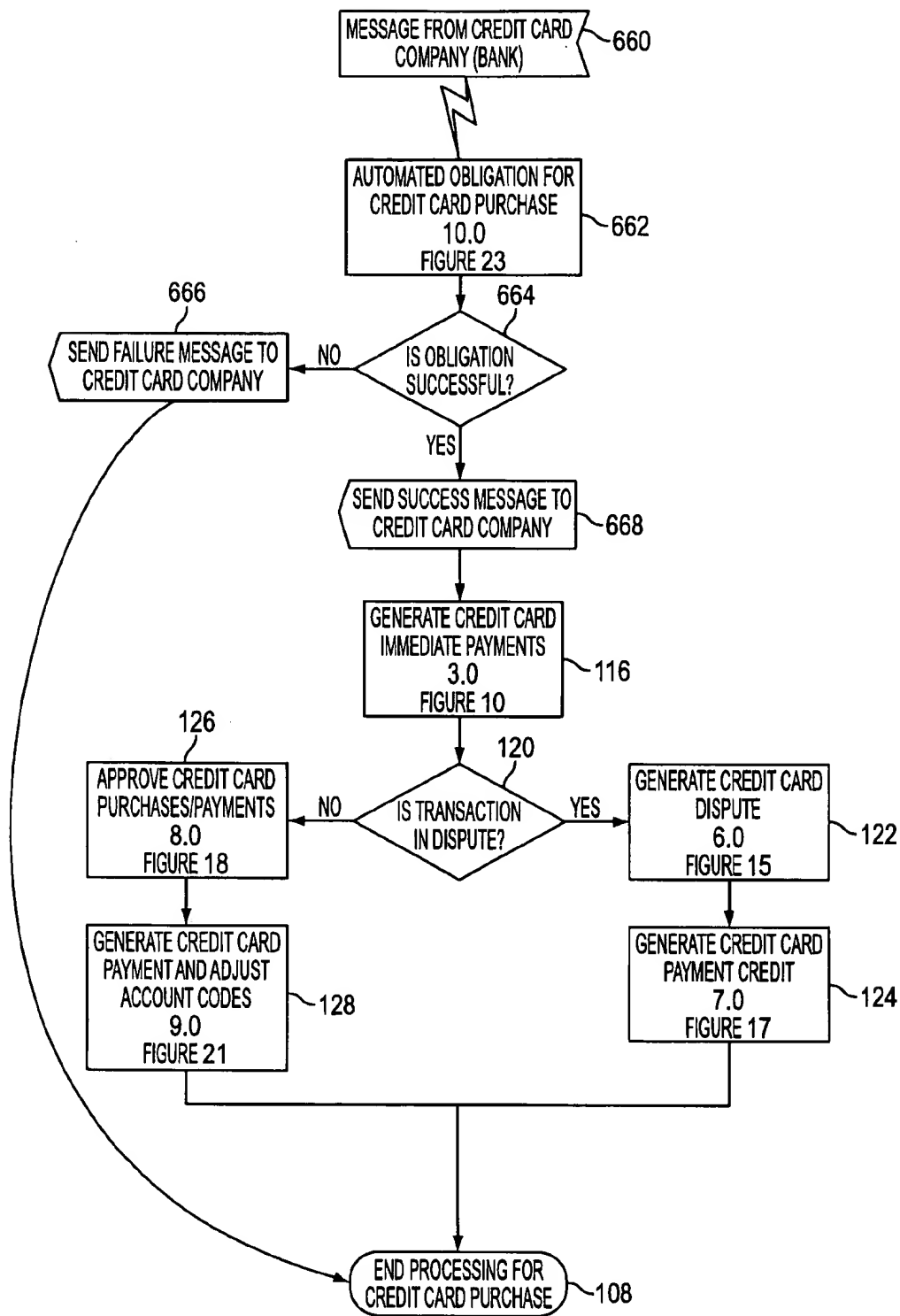


FIG. 22

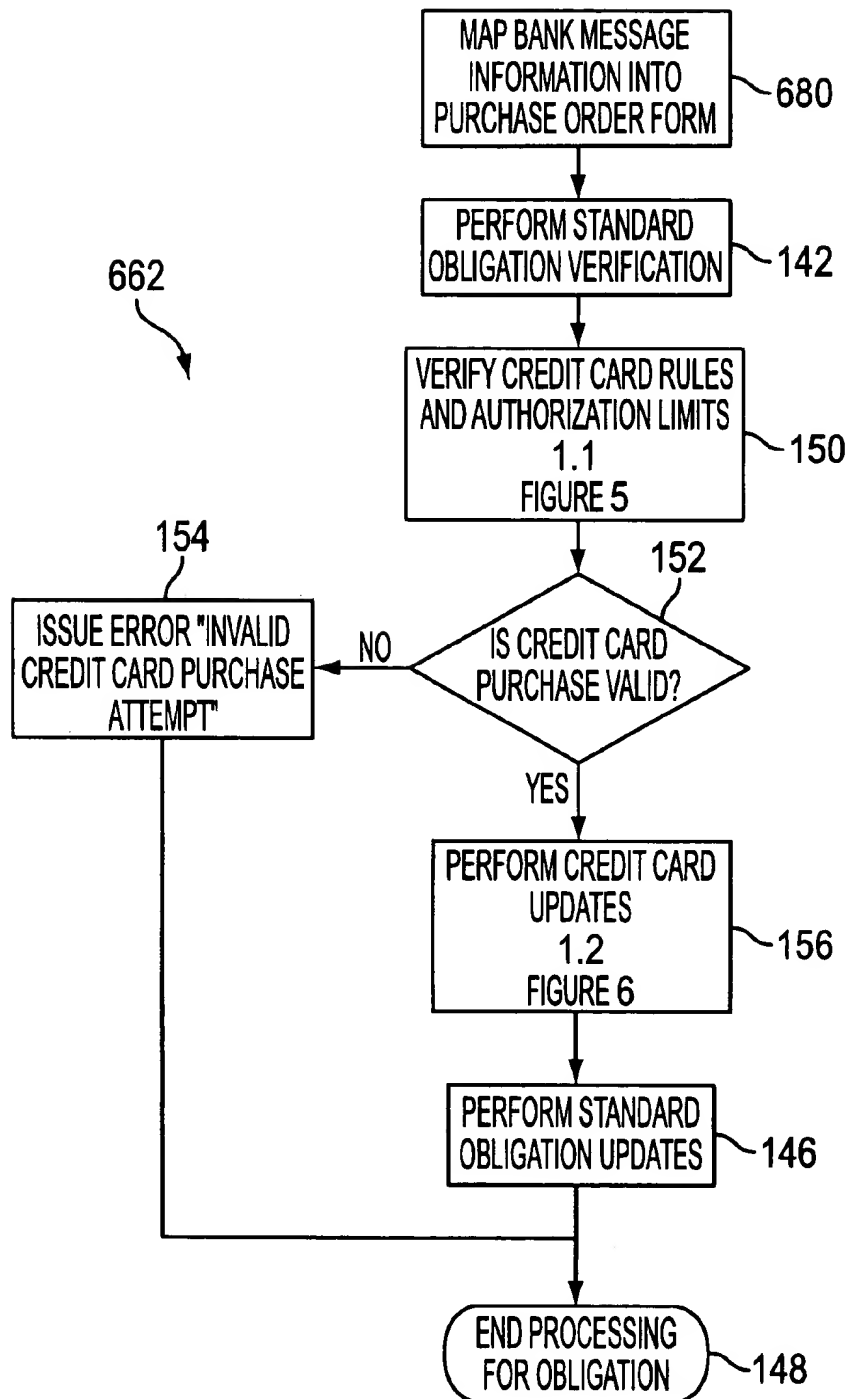


FIG. 23

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SYSTEM INTEGRATING CREDIT CARD TRANSACTIONS INTO A FINANCIAL MANAGEMENT SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is directed to a system that accounts for credit card transactions within a financial management system where credit card purchases are automatically reconciled to the proper accounts based on credit card number and, more particularly, to a system in which card transactions are subject to controls associated with internal financial system limits such as single purchase limits, account limits, budget limits, etc. which are independent of the credit card company issuer limits and which are set prior to the actual transaction.

2. Description of the Related Art

Credit card transactions are becoming an ever more prevalent method of making purchases by large organizations, particularly small purchases of consumer type items needed on an immediate basis. Organizations want to maintain control over the continuously growing number of these transactions. Such organizations typically operate a financial management system such as Momentum™ Financials available from American Management Systems, Inc. (AMS). Typically, such systems record credit card activity after the fact. An interface reads the credit card files supplied by the credit card company and creates transactions within the system to reflect the purchases and provide for payment. Such systems do not provide for automatic internal controls. Typically, reconciliation for credit card transactions is a paper based process which requires each cardholder to review all of their own card transactions and compare them with vendor invoices or a personal ledger of credit card transactions that the individual keeps.

What is needed is a system that provides the automatic controls and tools necessary to properly account for and manage credit card activity within a financial management system.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system that subjects credit card purchases to internal company credit limits and single purchase controls in addition to controls implemented by the credit card company.

It is also an object of the present invention to subject credit card purchases to internal controls, including budgetary, financial planning, project and general ledger controls, prior to the occurrence of the actual transaction.

It is another object of the present invention to provide a financial management system that completely tracks credit cardholders, individual credit limits and default accounting codes for each credit card authorized within the financial management system.

It is an additional object of the present invention to provide for the accounting of credit card transactions through all stages of the transaction including requisition and/or obligation which precede the actual card transaction through to payment to the credit card company.

It is a further object of the present invention to provide for automated handling of disputes over card purchases.

It is an object of the present invention to provide a system that automatically reconciles the recorded financial transactions and the card activity as recorded by the card company.

It is another object of the present invention to provide access to credit and information in the financial system to cardholders through the Internet.

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The above objects can be attained by a system that controls and accounts for credit card transactions within a financial management system. The invention places limits on the card transactions and ensures that the transactions comply with budget, financial planning and general ledger controls. The transactions can be obligated prior to or during the actual transaction with the bank and thereby subjected to the controls of the financial management system. The invention provides for the complete reconciliation of the credit card transactions with bank records after the transactions occur. The system automatically reconciles the transactions recorded by the bank with those recorded in the financial system and updates budgets, plans, projects, and general ledger entries accordingly.

These together with other objects and advantages, which will be subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates an architecture of the present invention.

FIG. 2 shows a system model of a system according to the present invention.

FIGS. 3-21 depicts the flow of processing when the purchase is not interactive.

FIGS. 22 and 23 depict the flow of processing when the transaction is interactive and approved by the financial management system at the time of the purchase from a vendor.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is directed to a system designed to provide for the control and accounting for credit card transactions within a financial management system. The financial management system would typically be used by a company seeking to track and control small purchases generally made via credit card. However, the system is also useful for state and federal government agencies that desire the same level of tracking. The system provides several levels of control for managing credit card transactions while also ensuring that the credit card transactions conform with the standard budget, financial planning, and general ledger controls used for standard financial transactions.

Rather than simply accounting for credit card transactions after the fact, the system allows credit card transactions to be captured prior to the actual transaction with the bank, in the form of a requisition or an obligation, and subjected to the controls of the financial management system. Each card transaction is subjected to the standard financial management system controls for funds availability and security as well as controls for internally managing purchase limits for the employee cardholders. Transactions passing the controls are recorded using the appropriate general ledger accounts for the type of transaction.

The system provides for the reconciliation of the credit card transactions with the bank records after the transactions actually occur. Any discrepancies are flagged and identified for user intervention. The system performs the necessary updates, including budget, financial planning, project, and general ledger updates and the liquidation of open items, to indicate that the transaction has been completed. The system also allows cardholders to identify disputes and track the dispute correspondence with the card issuer.

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The system tracks each credit card and its relevant information including card number, cardholder, issuing company, expiration date, etc. The system allows internal credit limits including billing cycle limit and single purchase limits to be assigned for each credit card or a group of cards. These limits, which for convenience are called financial system limits, are to be enforced within the financial management system and operate independently of any credit limits imposed by the issuing company, which for convenience are called issuer limits. These limits are used when a transaction is to be approved at the time of a purchase, during obligation and approval. In addition to limits, the system allows a default accounting distribution or default account codes to be assigned to each card where effects of the transaction are recorded within the financial management system.

With the integrated system of the present invention, an organization may require credit card purchases to be recorded in the financial system prior to their actual occurrence. The system allows such anticipated credit card purchases to be recorded as obligations. As these obligation transactions are recorded, they are subjected to the standard financial controls, which may include budget, financial plan, and project funds availability checks, and the standard security controls, which may include user ID and password checks as well as secondary approvals based on the transaction dollar amount and/or the type of goods to be purchased.

When an organization uses the feature of obligating credit card purchases before they occur, the system tracks each anticipated purchase and stores the information needed to later reconcile the purchase with the credit card statement. As obligations for credit card purchases are processed, the system verifies that the credit card's single purchase limit and billing cycle purchase limit are not exceeded.

An important element of the system is the automated reconciliation function. For each billing cycle, the credit card company provides an electronic file with the details of the credit card purchases, essentially the credit card statement. The system automatically loads the contents of the statements file into a database and allow users to reconcile purchases, register disputes, and/or trigger payments to the credit card company.

When an organization employs the model of committing or obligating credit card purchases before the transaction is received from the bank, the system performs an automatic reconciliation between the outstanding requisitions and obligations in the system and the credit card statement records received from the bank or credit card company. When a match is found, the credit card transaction is marked as reconciled and eligible for payment. The system is flexible in that the organization can determine if the reconciled transactions can be paid upon reconciliation or whether the credit cardholder or his supervisor must still approve the actual payment of the transaction.

At the time a credit card transaction is reconciled and/or approved, the user has the opportunity to alter the internal accounting codes (or override the default codes) associated with the transaction. If payment for the credit card transaction has already been made and the accounting codes have been altered, the system backs out the updates associated with the original accounting codes and performs the updates needed for the new accounting codes. The back-out and re-do of the updates ensures that the proper budgets, financial plans, projects, and general ledger account balances have been updated to reflect the true accounting codes of the credit card transaction.

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An organization has the option to immediately pay the credit card company upon receipt of the statement information or to delay payment until each credit card transaction is reconciled by the actual purchaser. When immediate payment is chosen, the system generates payment authorizations which are processed to allow for the disbursement of funds through the organization's own payment authority, such as the company treasurer or if the payment authority is the U.S. Treasury to authorize a disbursement through the U.S. Treasury's electronic payments and checks systems. When the immediate payment is not used, payments are warehoused until the credit card transactions have been reconciled using information from either the initial obligation and/or the statement received from the credit card company.

When the payment authorizations are generated and processed, the accounting codes are taken from the credit card set-up information. This allows the appropriate budgets, projects, general ledger accounts, and financial plans to be updated as the payments and subsequent disbursements are processed.

The present invention is preferably implemented in an application architecture 10 as depicted in FIG. 1. Workstations 12 interact, via a suitable interface program, with an application server 16 which accesses data of the financial management system within a database server system 18 where a processor 20 accesses a financial system database 22 stored within a disk array 24. The workstations 12 can be typical desk top computers. The workstations 12 can be connected to the system 16 directly or via a packet-switched network, such as the Internet. Typically, a company (or possibly a government agency) will have a multitude of such workstations 12, allowing each employee access to the system. The database server 20 can also be similarly connected via such a packet-switched network.

Although not shown in this figure, the system 10 communicates with a credit card issuer 36 as well as a payment authority 46 (see FIG. 2). Typically, these communications are via a magnetic media, such as tape. However, direct connections or connections over a packet-switched network are also within the architecture contemplated by the system described herein.

The architecture 10 preferably executes a financial management system, such as Momentum™ Financials available from AMS, that performs basic financial management operations such as comparing purchases to budgets, etc. A suitable operating system for the architecture 10 is the UNIX operating system or the WindowsNT operating system while a suitable set of programming languages include using C++ for server components, Smalltalk for the screen (desk top) components and JAVA for the Web version of the screen components. The computers of the architecture include the computer readable storage (RAM, ROM disks, etc.) upon which the processes and data structures of the present invention can be stored and distributed to customers, if desired. The processes can also be distributed to purchasers via downloading over a network, such as a packet switched network using an electromagnetic wave, such as a carrier wave.

The credit card financial management system of the invention operates in an environment having a system model 30, as shown in FIG. 2, where an employee 32 is issued a credit card 34 by a credit card issuer 36, such as a bank, as authorized by the company/employer 38 of the employee 32. The employer 38 can be a corporation or a government agency, such as the U.S. Patent and Trademark Office. The employer 38 uses the system of the present invention.

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Typically, the employee 32 makes a credit card purchase with a vendor 37. The vendor 37 communicates the transaction to the issuer 36 and the purchase is communicated to the company 38 by the issuer 36 via an electronic credit card statement 40. If necessary, the statement is used by the system to reconcile the purchase, with assistance of the employee 32 via an Internet session, for example, or to create an electronic dispute record 42 communicated to the issuer 36. When the purchase is reconciled electronic payment authorization information 44 is communicated to a payment authority 46, such as a company treasurer or the U.S. Treasury. The payment authority 48 makes a payment (electronic or check) to the issuer 36.

Prior to discussing the processes of the present invention in detail with respect to FIGS. 3-23, three types of credit card transactions that the system is designed to handle will be briefly discussed.

Prior to credit card transactions being processed by the credit card financial management system, information needs to be provided to the system that will authorize a particular person and credit card to initiate transactions within the system. This card set-up is performed from one of workstations 12 where information associated with the cardholders name, the card number, the card issuer, purchase limits for a billing cycle and a single purchase, default account codes, processing rules (approvals) for this card, etc. are stored in the system. Some of this information, such as credit card number is obtained from the credit card bank 36, either via a paper/verbal communication with the bank 36 or via an electronic transaction with the bank 36. If the card transactions are to be approved at the time of purchase by the financial management system, this information is communicated to the bank 36.

In a first type of transaction, which for convenience is called a non-preapproved transaction, the cardholder purchases an item at a vendor 37 and, after the normal processing by the bank or credit card issuer 36, the bank 36 transmits the transaction to the system. The purchase transaction can arrive on a recording medium such as a traditional tape or as an electronic transaction over a communication network, such as a packet-switched network, as previously mentioned. The system automatically checks the transaction against all limits, and if the transaction meets all the approval criteria for this card, it processes that transaction using the rules designated for this card debiting the default accounts and issuing a payment authorization to the payment authority 46. The payment authority 46 makes the payment to the bank 36. If the transaction does not pass the internal checks, such as exceeding an internal company single purchase limit or would cause a budget item to be exceeded, the transaction can be flagged for internal resolution. The system can be configured to go ahead and authorize payment for the purchase or it can be held. In either case the cardholder, supervisor or other person with sufficient authority is notified by an appropriate message. This person accesses the system and performs the operations necessary to resolve the transaction.

In a second type of transaction called a preapproved transaction, the cardholder accesses the system through the work-station 12 and creates an obligation. An obligation is a transaction in which the amount of the transaction can be anticipated, the product to be purchased is known, the vendor is known, the account codes of the accounts/budgets affected by the transaction are known, etc., and one which has been approved. It is a transaction for which the system recognizes that approval for the credit card purchase has been previously authorized. The user then makes the pur-

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chase at the vendor 37 and when the purchase transaction arrives from the bank 36, the system essentially transmits a payment authorization to the payment authority 46 and then reconciles the transaction by debiting the proper accounts, etc. If a dispute arises, a mechanism is available to credit the company 38 for the transaction in a later payment authorization.

In a third type of transaction, called an interactive transaction, at the time of the purchase at the vendor 37, after the purchase has passed the limit processing of the bank 36 but before the bank 36 sends an approval back to the vendor 37, the bank 36 sends a approval request to the system. This approval request includes the card number, the amount of the purchase, the vendor and a product/service code (typically one designated by the U.S. government or some other entity). The system, at a minimum, checks the amount of the purchase against the internal card limits set by the cardholder's company 38 and returns an approval or disapproval response based on the determination. The system before approving the purchase can make checks other than just checking the credit card internal limit. For example, using the product code, the system can also check to see if the transaction is of a type that matches an authorized account for this cardholder. For example, if the product code indicates that a personal computer is being purchased but the cardholder is not authorized to spend money from a computer purchase account, the transaction can be disapproved. When the actual purchase transaction arrives later at the system from the bank 36, the transaction is processed as previously discussed.

This third type of transaction allows additional features to be provided for a company 38. For example, when a transaction has been preapproved by the creation of an obligation and the approval request arrives from the bank 36, the system, in addition to approving the transaction, can substantially immediately send a payment authorization to the payment authority 46 which could pay the bank 36 before the end of the billing cycle in which the actual transaction occurred. Such early payment would allow the bank 36 to provide the company 38 with more favorable credit card credit terms or discounts.

The details of the processes that allow these transactions to be processed by the system of the invention are discussed below.

The credit card purchasing process can begin, as depicted in FIG. 3, with the employee 32 creating 102 an obligation for a credit card purchase where the system checks to determine whether the purchase is within the various purchase and budget limits. This obligation creation step inputs the credit card information as well as the necessary accounting information. This processing 102 will be discussed in more detail with respect to FIG. 4. Next, the system determines 104 whether the purchase has been approved. If not, the obligation is canceled 106 and processing ends 108.

If the obligation has been approved, the system then determines 110 whether the credit card issuer provides an electronic credit card statement. If so, the transaction can be processed electronically and if not a manual reconciliation process is performed 112 where the employee 32, and others necessary to the reconciliation process, are provided with information, via screen displays on the work-stations 12, allowing the employee 32 to confirm whether the purchase is correct and should be paid. In this process the employee 32 is presented with the credit card statement, reviews the statement against purchase receipts and other personal notes and indicates whether the purchase is correct or in dispute.

The purchase can be in dispute for a number of different reasons, such as the purchase amount on the statement being incorrect due to returns of part of the purchase which is a dispute with the bank 36 or because the employee is not satisfied with the purchased items which is a dispute with the vendor 37.

If the bank 36 does provide electronic statements 40, the system processes 114 the credit card statements file. This step 114 can also be an entry point into the processes of the invention. This operation 114 essentially maps the format of the statement to the format of the records of the financial management system, such as Momentum™ Financials. This process 114 will be discussed in more detail with respect to FIG. 7. Next, the system generates 116 immediate payments on the credit card, if any are to be generated, which results in a payment authorization being sent to the payment authority 46 based on an unreconciled statement rather than after reconciliation has occurred. Any disputes are handled via credits whenever payment is generated immediately upon receipt of the statement. By being able to pay for the transactions on the statement substantially immediately, the company 38 can seek better credit terms or a discount. In this process, if the card issuer 36 provides discounts for early payment, the "income" associated with the discount can also be calculated. This process 116 is discussed in more detail with respect to FIG. 10. Automatic reconciliation 118 occurs next and includes essentially matching the amounts of obligations to the credit card statement transactions. If matches exist the credit card transaction is marked as reconciled and otherwise it is manually reconciled. The process 118 is discussed in more detail using FIG. 12.

Once reconciliation has been performed, the system determines 120 whether any disputes exist. If so, the system generates 122 a dispute, which identifies the card number, the transaction, the amount, the type of dispute (vendor or bank) and the employee's justification for the dispute, such as double debits. The dispute is then sent to the bank 36. This process 122 will be discussed in more detail using FIG. 15. The system then generates 124 a payment credit (or offset) for the credit card for the transactions in dispute which is held until a later processing cycle when the dispute can be resolved. This operation 124 is discussed later herein with respect to FIG. 17.

If there are no disputes, the system performs a second approval process 126 where the credit cardholder 32 can review and approve (or disapprove—reject) the transactions, as long as they are within the employee's approval limits. The employee can also change the account codes indicating where the transaction is to be posted. A credit card group holder, a person at the company 38 responsible for a group of employees having credits cards, can also review and approve (or disapprove) the transactions at a different limit level. This process 126 will be discussed in more detail with respect to FIG. 18.

Next, the system generates 128 payments and, if necessary, adjusts the account codes of the credit card transaction with respect to what accounts within the financial management system are affected. A transaction which is set up for immediate payment is paid using a set of default account codes that are set at the time the credit card is issued to the employee 32. When the transaction is reviewed for reconciliation and/or approval the employee may have changed the account codes to allocate the purchase to an account that is different from the default account. This operation 128 essentially internally backs the transaction out of the default accounts within the financial management system and enters it into the accounts selected during the

reconciliation and approval process. These processes 128 will be discussed in more detail later with respect to FIG. 21.

The obligation process 102 starts with the employee entering 140 the transaction information via the work-station 12 as illustrated in FIG. 4. This information, if it is an itemized or detailed obligation, can include the amount of the intended purchase, the vendor, the type of purchase (typically using the standard government codes for products/services), the account codes for the purchase, etc. If the obligation is being created after the purchase, such as when the employee 32 has made a telephone purchase with the credit card, the information can also include the approval code issued to the vendor 37 by the bank 36 and other information that may be included on an invoice, such as date, time, product or service code, vendor and vendor location. This information is checked 142 for validity using the standard validation criteria and processes of the financial management system, such as Momentum™ Financials. Additionally, checks of the budget, financial plan, and project balances associated with the accounts are made to determine whether the purchase is within the funding associated with the employee and the accounts. Next, the system determines 144 whether the information being processed includes an actual credit card number or an alias. Aliases are used when the access to the actual card number needs to be restricted, such as when a clerk is entering information from an obligation form.

If neither an alias nor a credit card number is present, the system performs 146 standard obligation updates as typically occur in a financial management system, such as Momentum™ Financials, and obligation processing is complete 148.

If an alias is present, the system accesses the credit card table to infer or determine the true credit card number and continue processing. The credit card table holds information and processing rules pertaining to the individual credit cards such as card number, alias, type, approval group, effective dates, active flag, holder, expiration date, single purchase limit, bill cycle purchase limit, default dispute accounting codes, default payment accounting codes, etc. If the alias is invalid and the credit card number cannot be determined, the system issues an invalid purchase attempt message to the employee 32. If an alias or a credit card number is being used, the system verifies the obligation against the credit card authorization limits for the employee for single purchases and purchases within a billing cycle as well as verifying 150 that the rules for the credit card are not being violated, such as the type of product eligible for purchase, and which will be discussed in more detail using FIG. 5. Next, the system determines 152, from the verification processing, whether the purchase is valid. If not, the system issues 154 an invalid purchase attempt message to the employee 32. If the purchase is valid, credit card updates 156 are performed 156 which essentially includes allocating an obligation amount and an obligation identifier within the financial management system, thereby indicating that an outstanding obligation exists (a set aside or allocation of an amount of purchase authority). This obligation becomes the basis for a reconciliation when the credit card statement arrives from the bank 36. The updating 156 will be discussed in more detail with respect to FIG. 6.

In verifying the credit card obligation against rules and limits 150, the system first determines 170 whether an alias has been entered. If so, alias records in the credit card table are accessed 172 to determine 174 whether the alias is valid. If not, a message is issued indicating that an error in the entry of the alias has occurred and processing ends 178. If

the alias is valid, the credit card number is mapped or determined 180 from the alias and the credit card number records in the credit card table are accessed 182 to determine whether the card number is valid. For example, a card can have a valid alias but the card can be beyond the expiration date for the card number. When the card number is not valid, the system issues 186 an appropriate message and ends 178 transaction processing.

If the card number is valid, the system then determines 188 whether the card has been set up to use default account codes. If so, the default codes are set 190 for this obligation and these defaults can be displayed to the employee 32 at the work-station 12 to allow them to be changed.

After processing with respect to the account codes, the system checks 192 the amount of the obligation to determine if it exceeds the single purchase limit for the card and if so issues 194 an appropriate message.

To determine whether a billing cycle limit for the card has been exceeded, the system accesses 196 a billing cycle summary table to obtain the current billing cycle information for this card and adds 198 the obligation amount to the total. If this total exceeds (200) the cycle limit for the card, a message is supplied 202 to the employee 32 indicating that the cycle limit has been exceeded.

In the credit card purchase updates process 156, the system processes individual obligations in a loop 220-222, as depicted in FIG. 6, where each cycle of the loop corresponds to an obligation that has been created and, when all obligations have been processed, processing ends 224. The process, however, starts with the system inserting 226 a record in the credit card purchase table. The credit card purchase table holds information for each credit card purchase entered into the financial system using the purchase orders or purchase order forms, such as credit card number, purchase order document number, charge date, authorization code, vendor name, city and state, reconciliation status, etc. This insertion operation inserts an entry for the current transaction (an obligation transaction as opposed to an actual credit card purchase transaction which is received from the bank 36) for this credit card in the table that stores the purchase activity for the cards. In this situation the entry includes card number, amount and obligation identifier. Next, the system determines 228 whether there is a billing cycle record for this card and, if there is no cycle record, the system creates 230 a record which includes the information noted above. The system then adds 232 the amount to the card total for the cycle. The system then determines 234 whether a group level billing cycle summary table entry exists for this card, if not an entry is created 236 at the group level and the amount is added 237 to the group total. The loop is then entered and for each obligation line, the record is inserted 238 in the credit card purchase detail table and inserted 239 in the credit card activity table. The credit card purchase detail table holds detailed information for each credit card purchase entered into the financial system using the purchase order forms, such as credit card number, purchase order document number, purchase order line number, purchase amount, reconciliation/liquidation amount, etc. Each entry in this table corresponds to a line or item on a purchase order.

The credit card purchase process where the credit card statements are processed 114, as depicted in FIG. 7, begins by accessing 240 the credit card statements table with the statement ID. The credit card statement table holds information for each credit card statement that has been received from the credit card issuing organization such as statement

number, payment due date, total amount due, credit card type, prepayment made flag, prepayment authorization document number, etc. The system then determines 241 whether entry for this statement exists in the table. If so, an error message is issued 242 and the processing ends 243. If not, an entry is created 244 in the table and the statement details are processed 245 which will be discussed in more detail with respect to FIG. 8. Once the statement details are processed, the statement table is updated 246 and the statistics for the processed statement are catalogued and printed 247.

The processing 245 of the statement details, as depicted in FIG. 8, is performed within a loop 248-249 where the records of the statement are processed one at a time.

In this loop, the system accesses 250 the credit card table to obtain that credit card number on the statement and determines 251 whether the number in the statement is valid. If the number is not valid, an error message is issued 252 and a record is written 253 to an error file indicating the type of error. This file will be sent to the bank 36 at the end of processing. If the card number is valid, the system maps 254 the fields of the statement record to the fields of the statement detail table for the credit card maintained by the system. This credit card statement detail table holds detail information for each credit card statement that has been received from the credit card issuing organization including statement number, statement line number, credit card number, transaction number, charge date, posting date, authorization code, vendor name, city and state, payment accounting codes, charge amount, reconciled amount, prepayment authorization line number, reconciliation status, etc. Each entry in this table corresponds to an individual credit card transaction reported on the statement. An optional credit card statement item table can also be used and holds item information for each credit card transaction included in the statement that has been received from the credit card issuing organization, such as statement number, statement line number, detail line number, product/service code, standard industrial code, description, amount, etc. This information can be important for monitoring purchasing trends and identifying credit card abuse. A key to the statement detail table is then assembled 255 using the statement number, credit card number and the credit card transaction number. The credit card statement table is then accessed 256 using the key to determine 257 whether the record for the purchase already exists in the table. If so, it is a duplicate purchase and an error is issued 258. If the record does not exist, the table is updated 259 with the entry and statistics on the contents of the table are updated 260 to reflect such things as the number and types of purchases that were included in each statement file from the bank 36. Next, the item details of the statement are processed 261 which will be discussed below with respect to FIG. 9.

The item details process 261 operates on a per record basis in a loop 262-263 as shown in FIG. 9. The system determines 264 whether the record includes data and an item level. If not, the next record is read 263. If so, the record fields are mapped 265 to the detail table. Next, a key is created 266 and used to access 267 the detail table to determine whether an entry exists in the table. If so, the entry is updated 269 with the dollar amount. If not, the table is updated 270 with the entry. Lastly, the statistics for the statement are updated 271.

In generating immediate payments 116, as depicted in FIG. 10, the system operates in a loop 280-281 to process each entry in the credit card statements table and payment authorizations are assembled. At the end of this loop the

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system processes 282 payment authorizations for each card issued and sends them to the payment authority 48 for payment and terminates 283 this operation. In the loop the system first determines 284 whether the statement entry is to be processed in the designated billing cycle. The processing cycle for the company 38 may not match the billing cycle for the bank 36 and only those transactions that fall within the processing cycle of the company 38 are currently processed. If the entry is to be processed, the system accesses 285 the credit card type table to obtain the type for the card. The credit card type table holds information and processing rules, such as whether immediate payment is applicable, pertaining to the valid types of credit cards (e.g., Diner's Club, AMEX, IMPAC) as well as credit card type, number alias, vendor, effective dates, credit card name, active flag, vendor payment address, vendor dispute address, reconciliation method, payment authorization generation flag, default payment accounting codes, amount tolerance, date tolerance, billing cycle end day, etc. The rules for credit card processing are preferably set up based on the type of card. Some cards must be paid at the end of the billing cycle, these type cards typically charge no interest and would be set up for immediate payment. If the type is not set 286 for immediate payment, the processing moves to the next entry. Otherwise, a payment authorization (form) is created 287 for this statement. Next, the immediate payment lines are generated 288, as will be discussed in more detail with respect to FIG. 11. If a discount is to be applied to the immediate payment, the discount terms are established for the credit card issuer in a vendor table. For example, a 2% discount if paid within two days. The payment authorization and subsequent disbursing processing calculate the discount and update the budgets and general ledger with the discount. Then, the statement table is updated 289 to include a prepayment document number entry and reflect that the entry has been paid.

As depicted in FIG. 11, the generation 288 of the immediate payment lines includes a loop 284-285 that processes entries in the detail table until the end of the table is reached and processing is terminated 286. The first step is to create 287 a payment authorization line or specific authorization item in the authorization and set 288 the type for the item to "prepayment". Next, a determination is made 289 as to whether the card has default account codes. If so, the codes are added 290 to the payment authorization line or item. Otherwise, the account codes for the card type are provided 291 for the payment authorization line. The authorization is then added 292 to the file for the particular bank 36 issuing the card and the detail table is updated 293 with the authorization line number.

During automated reconciliation 118, as shown in FIG. 12, the system operates in another loop 320-322 where each entry in the statement table is processed until the end is reached and processing terminates 324. The first step is to access 326 the credit card type table to obtain the type for the card. Based on the type, a determination 328 is made as to whether statement or obligation reconciliation can be performed and, if not, the manual process is performed 112 (see also FIG. 3). The system then enters a loop 330-332 where the entries in the detail table are processed. In this loop, the systems attempts to find 334 a matching obligation which will be discussed in more detail using FIG. 13. If a match is not found (336), the next entry is processed. If a match is found, a determination 338 is made as to whether the purchase has been disputed. If not, reconciliation updates are performed 339, as will be described with respect to FIG. 14, and the credit card statement table is reconciled.

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The matching obligation process 334 (FIG. 13) also includes a loop 340-342 where all the open billing cycles are reviewed for a matching transaction. First, a determination 344 is made as to whether the statement includes an approval code which was issued at the time of the purchase when the vendor 37 requested approval from the bank 36. If so, a search 346 of the credit card obligation table is performed using the approval code, card number and billing cycle. A determination is then made 358 as to whether a match exists. If not the table is searched 350 with the amount, card number and billing cycle. Again a determination 352 is made as to a match. If there is no match the card number and billing cycle are used for a search 354 of the purchase table. At the end of the search match loop 340-342 the system determines 356 whether a matching obligation has been found. If not, the entry is updated 358 as unreconciled and to be processed via a manual reconciliation later and processing ends 360. If a match has been found the vendor is checked 362 for a match. If there is none, an error message is issued and the entry is marked 366 reconciled with errors. The user can also approve the transaction to allow it to be paid or a dispute can be lodged or setup. When there is a vendor match, the purchase amount and purchase date are compared to the corresponding tolerances for the credit card type maintained in the credit card table. If the date or amount is outside (370) the tolerance, the system issues 372 an error message indicating that the obligation does not match and the entry is marked as reconciled with errors. If the amount is within the tolerance, the entry in the obligation is updated 374 as reconciled.

During the reconciliation update process 339 (see FIG. 14) the purchase table entry being processed is updated 380 to a status of reconciled and the purchase detail table is updated 382 with the reconciled amount. The statement table is also updated 384 by adding the amount to any previous reconciled amount accumulated, followed by doing a similar addition to the statement detail table. Next, a reconciliation table entry is created 388 linking the purchase and statement details. The credit card reconciliation table typically holds the results of all reconciliations, including both automated and user-driven reconciliation activity, such as statement number, statement line number, dispute number, purchase document number, purchase document line number, credit card number, accounting codes, reconciled amount, purchase partial/final flag, distribution method flag, payment document number, payment document line number, prepayment reversal document number, prepayment reversal document line number, status, etc. A determination 390 is then made as to whether the purchase amount equals the statement amount and, if so, the new entry in the table is set 392 to a final reconciliation status, otherwise, it is set 394 to a partial reconciled status. If the type of credit card requires (396) approval the entry is set 398 to a status requiring approval, otherwise, it is set 400 to a status where approval is not required. The update processing then ends 402.

During dispute processing 122, the system allows the employee 32 to enter 420 and then accepts 421 the criteria to select items in the statement detail table for display, as illustrated in FIG. 15. This can be another entry point into the processes of the present invention. That is, the employee 32 can initiate the dispute process at any time. The criteria entered by the employee 32 could include a vendor identifier, purchase range limits and other information which will help identify a transaction. This information is used to search 422 the statement detail table. If a match is not found (423), a message is supplied 424 to the employee 32 and the employee can enter/change the search criteria. When the

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questioned item is found, the employee 32 can enter 425 the justification for the dispute which is used to update the statements table indicating that the item is in dispute, thereby acknowledging and tracking disputes over credit card purchases. As an option the user can accept 426 the users accounting codes for the dispute. The system then performs 427 the updates (see FIG. 16) associated with the dispute. If an on-line connection is available (428) to the bank 36, the system sends 429 a dispute message to the bank 36. Otherwise, the dispute is written 430 into a dispute file, statistics for the statement are updated 431 and dispute processing ends 432. As an extension of the above, the user may also initiate a dispute against an obligation. The dispute still needs to be matched against a statement, but this allows the end-user to record a dispute at the earliest possible time. For example, if the goods received are defective, but the credit card statement has not yet been received.

During the dispute update operation 427 (see FIG. 16), the system generates 434 a unique identifier for the dispute either with the user or automatically. A dispute table entry is then created 436 with the justification and the amount. The credit card dispute table, an optional table, holds detailed item information for each credit card transaction included in the statement received from the credit card issuing organization, such as credit card number, dispute number, dispute amount, reconciled amount, justification, dispute date, dispute accounting codes, reconciliation status, etc. Next, a linking entry in the reconciliation table to the dispute is created 438. The system then determines 439 whether the statement has been paid by looking at the payment status in the reconciliation table entry. If not, the reconciliation table is updated to indicate that the entry is awaiting reconciliation, otherwise, the entry is set 441 as awaiting payment. The statement detail table is then updated 442 and update processing of the disputes ends 443.

A loop 460-462 in the credit process 124 processes each entry in the credit card reconciliation table and starts, as shown in FIG. 17, with determining 464 whether the entry has been marked as disputed. If not, processing ends 468. If so, the statement is checked 470 to determine whether the entry has been marked as paid as can occur when the payments are generated immediately (see 116). In the case where the payment has been made and it is in dispute, a no-check authorization or credit is made 472 through the payment authorization for the entry to prevent the entry from being paid, followed by creating 474 a negative expenditure line or item in the credit card statement detail table for the account code which backs out the previous payment. Next, a positive prepayment or advance is created 476 for the credit card table, essentially showing an over payment to the bank or card issuer 36. Next, the reconciliation table is updated 478 with an identifier for the reversal and to indicate 480 that the entry is awaiting reconciliation. Then, the positive payment is authorization is processed 482, thereby deducting the amount from the money owed to the bank 36.

FIG. 18 illustrates the approval process 126 and starts with applying 500 the cardholder approvals which will be discussed in more detail using FIG. 19. A check is then made 502 as to whether the entry has cardholder approval and if not the entry is bypassed 504 and processing ends 506. When the entry has been approved, the employee 32 can change 508 the account codes after which the group approval process is performed 510 (see FIG. 20). Next, a determination 512 is made as to whether the reconciliation table has all the necessary approvals and, if so, the table is updated 514 as fully approved.

The cardholder approval process 500 (FIG. 19) includes an outer loop 530-532 which loops on the holders credit

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cards within which the credit card statement entries for each card are displayed 536 and an inner loop 538-540 which exists for processing each entry in the statement. As each entry is processed, the employee 32 is first asked 542 whether the purchase is approved. If not, the entry enters the dispute process 122 (see FIG. 15). If the purchase is approved, a check is made 544 concerning the card single purchase limit. If the limit is exceeded, a message is issued 546 and the entry is updated 548 as requiring special handling. A test of the billing cycle limit is also made 550 which, if exceeded, results in a message 560 and special handling 548. When no limits are exceeded, the entry is updated 562 as approved.

The process 510 for group approval, as depicted in FIG. 20, includes most of the same steps as the cardholder approval process of FIG. 19 but the approvals are at the group level limits and the person approving the purchase is presented all of the statement entries for all of the cards in the group. For convenience, these steps 580-602 will not be discussed in detail.

In generating credit card payments and adjusting the account codes 128 the system process in a loop 620-622 (see FIG. 21) where approved entries in the credit card statements table are processed until all the statements have been processed, at which time the credits are processed 624 for payment authorization and processing ends 626. In the loop, each entry is examined 628 to determine whether it is in the cycle to be processed. If so, the system accesses 630 the credit card type table and obtains the credit card type using the card number. If the card is the type where post reconciliation is performed (632), the system creates 634 a payment authorization with the account codes of the table entry for the card. When the credit card is not the type for post reconciliation, the system checks 636 as to whether it is an immediate payment type. If the payment is immediate, the back-out of the immediate payment needs to be performed. To do this a payment authorization with a positive payment and the statement account codes is created 638 followed by creation 640 of a negative authorization having the default account codes. The authorizations are then added 642 to the list of authorizations for the bank 36 and the status of the entry on the reconciliation table is updated 644 as paid.

The manual or user-driven reconciliation process 112 uses a typical manual entry operation found in many financial management systems where the user is presented with a display and allowed to make entries or changes to certain items in the display. The process 112 handles four primary cases. In the first case, the organization uses purchase orders in the financial system to record credit purchases, and the bank provides electronic statements. In this case, the user is presented with a display of all unreconciled purchases in the statement detail table and allowed to view the purchases recorded on purchase orders and the transactions input from the electronic statement in parallel. The user is then able to reconcile the purchases with the transactions listed on the statement by performing matches and manually enter the reconciliation amount. In the second case, the organization uses purchase orders in the financial system to record credit card purchases, but the bank does not provide electronic statements. In this situation, the user is presented with a display of the purchases recorded on the purchase orders. The user is then able to reconcile the individual purchases with the transactions listed on the hard copy statement. For each purchase, the user can manually mark the purchase as reconciled and enter the reconciled amount. In the third case, the organization does not use purchase orders in the financial

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system to record credit purchases, but the bank provides electronic statements. In this case, the user is provided with the transaction information from the electronic statement (entries in the statement detail table). The user has the ability to reconcile a transaction by manually entering a reconciliation amount and/or dispute a transaction by entering a dispute amount and justification. In the last case, the organization does not use purchase orders in the financial system to record credit purchases, and the bank does not provide electronic statements. In this case, the user enters the transactions from a hard-copy statement into the financial system. If while creating the entry the user marks it as reconciled, the entry can be handled by the payment generation process. It can also be marked as in dispute and handled via the dispute process. For each user-driven reconciliation performed online, the system, as previously discussed, updates the reconciliation status on the associated statement, purchase, and/or dispute entries and creates an entry in the reconciliation table that links the statement, purchase, and/or dispute entries and allow payment processing to occur.

When the credit card transaction is to be approved by the financial management system interactively and in real-time at the time of the purchase from the vendor 37, the process of FIG. 3 is modified as depicted in FIG. 22. A message arrives from the bank 36 over a network, such as a packet switched network, and an automated obligation process 662, which will be discussed in more detail using FIG. 23, is performed. This step 662 is another entry point into the processes of the present invention. The message includes a transaction tag, the card number, the type of purchase, the amount, vendor name and vendor location. The system then checks 664 to determine whether the obligation was successful. If not, a failure message is sent 666 to the bank 36 which the bank can use to disapprove the transaction at the vendor 37 by sending an appropriate message to the vendor 37. For example, when the purchase amount exceeds the single purchase limit or the purchase is of a type of product, based on the product codes, that is not authorized for the default accounts for the card, a failure of approval or rejection can be generated. The message includes the transaction tag and a flag indicating the transaction has not been approved. If the obligation is successful, a success or approval message is sent to the bank 36 which can then send an approval code to the vendor 37. The date, amount and transaction tags of approved transactions are stored during the obligation process for later reconciliation. Upon success the system can generate 116 an immediate payment (see 116 FIG. 10), again allowing the company 38 to obtain most favorable credit terms or a discount. The remainder of the operations 120, 122, 124, 126, 128 and 108 have been previously discussed and will not be repeated for the sake of brevity.

In processing an automated obligation 662, the system first maps 680 the message contents into the fields of the records of the financial management system, as shown in FIG. 23. Then the operations previously discussed and associated with an obligation are performed. For brevity these operations 142, 150, 152, 154, 156, 146 and 148 will not be discussed again.

The many features and advantages of the invention are apparent from the detailed specification and, thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and

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accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. An integration system associable with a credit card issuing system issuing credit cards to multiple users of an organization with each of the cards having issuer limits and said integration system comprising:

a organization financial management system providing control and accounting for financial transactions of the multiple users within the management system, and providing financial system limits; and

a credit card management system associated with the financial management system and the credit card issuing system, and providing spending control for credit card transactions using the financial system limits imposed by the organization and providing accounting for the credit card transactions within a general ledger of the financial management system.

2. A system as recited in claim 1, wherein said credit card system checks the transactions against financial system employee limits imposed by the organization.

3. A system as recited in claim 2, wherein the financial system limits include one of single purchase limits, billing cycle limits, budget limits, organization account code limits, product type limits.

4. A system as recited in claim 2, wherein said credit card system subjects a purchase to the limits at a time of the purchase.

5. A system as recited in claim 1, wherein said credit card system automatically reconciles the transactions.

6. A system as recited in claim 5, wherein reconciliation searches for an obligation created in the financial management system at a time of a purchase.

7. A system as recited in claim 5, wherein reconciliation searches for an obligation created in the financial management system prior to a purchase.

8. A system as recited in claim 5, wherein reconciliation updates budget, planning, project and ledger entries of the financial management system of the organization.

9. An integration system associable with a credit card issuing system issuing credit cards to multiple users of an organization with each of the cards having issuer limits and said integration system comprising:

a financial management system providing control and accounting for financial transactions, and providing financial system limits; and

a credit card management system associated with the financial management system and the credit card issuing system, and providing spending control and accounting for credit card transactions with the credit card issuer within the financial management system using the financial system limits imposed by the organization and where said credit card system authorizes immediate payment to the credit card issuer of pre-obligated transactions.

10. An integration system associable with a credit card issuing system issuing credit cards to multiple users of an organization with each of the cards having issuer limits and said integration system comprising:

a financial management system providing spending control and accounting for financial transactions, and providing financial system limits; and

a credit card management system associated with the financial management system and the credit card issuing system, and providing spending control and accounting for credit card transactions with the credit

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card issuer within the financial management system using the financial system limits imposed by the organization and where said credit card system authorizes immediate payment to the credit card issuer of purchases approved by the credit card system at the time of purchase.

11. A system as recited in claim 1, wherein said credit card system validates credit card information on credit card statements.

12. An integration system associable with a credit card issuing system issuing credit cards to multiple users of an organization with each of the cards having issuer limits and said integration system comprising:

a financial management system providing control and accounting for financial transactions within an organization; and

a credit card management system associated with the financial management system and the credit card issuing system, and providing spending control and accounting, at a time of purchase, for credit card transactions of the financial management system of the organization using the financial system limits imposed by the organization and comprising checking the transactions against the organization financial system limits including single purchase limits, billing cycle limits, budget limits, organization account code limits, product type limits, validating credit card information on credit card statements, automatically reconciling the transactions by searching for an obligation created in the financial management system at a time of a purchase, updating budget, planning, project and ledger entries of the financial management system, authorizing immediate payment of purchases approved by the credit card system at the time of purchase and setting up disputes for unapproved purchases.

13. A method of processing credit card transactions, comprising:

receiving a credit card transaction from a card issuer; and automatically reconciling the transaction within a financial management system of an organization against a financial system record showing an intent to purchase.

14. A method, comprising:

receiving a credit card transaction from a card issuer for a vendor at a time of purchase to which issuer limits are applied by the issuer of a credit card; and

providing, by an organization separate from the issuer and at a time of transaction processing, control and accounting for the credit card transaction within a financial management system of an organization to which organization limits are applied and thereby approving/denying the transaction.

15. A method of processing credit card transactions, comprising:

receiving a credit card transaction from a vendor and subjecting the transaction to card issuer limits by an issuer of a credit card; and

subjecting the transaction, by an organization separate from the issuer and at a time of transaction processing, to financial system limits of the organization and thereby approving/denying transaction.

16. A method as recited in claim 15, wherein said financial system limits comprise one of single purchase limits, billing cycle limits, group limits, budget limits, planning limits, funds availability limits, organization account code limits, product type limits.

17. A method as recited in claim 15, wherein said subjecting converts the transaction into an obligation when the limits are satisfied.

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18. A method as recited in claim 15, wherein an intent to perform the transaction is captured by the financial management system before the transaction occurs.

19. A credit card system, comprising:

a credit card issuer system providing for approval of credit card transactions using issuer limits; and

a financial management system of an organization separate from and communicating with said issuer, accepting the credit card transactions and providing, at a time of transaction processing, approval of the transactions using organization limits and thereby approving/denying the transaction.

20. A system as recited in claim 19, wherein said management system provides pre-purchase approval of the transactions.

21. A system as recited in claim 19, wherein said management system authorizes immediate payments prior to approval, creates a discount transaction for the issuer in proportion to the payment and updates a discount income organization account in the financial management system.

22. A system as recited in claim 19, wherein said management system allows initiation and tracking of disputes with respect to the credit card transactions.

23. A credit card system, comprising:

a credit card issuer; and

a financial management system of an organization communicating with said issuer, accepting credit card transactions and providing automated handling of disputes over credit card purchases including tracking each of the disputes through resolution.

24. A system, comprising:

a packet-switched communication system;

a credit card issuing system issuing credit cards to multiple users of an organization each card having issuer limits and coupled to said communication system;

an organization financial management system coupled to said communication system, storing credit card information related to financial system organization account codes and accounting for financial transactions of multiple users comprising limits imposed by the organization with the transactions intermingling within the system; and

a user terminal coupled to said communication system and allowing a user access to the credit card information of the multiple users.

25. A system as recited in claim 24, wherein the system organization account codes relate to user credit card budgets.

26. A computer readable storage medium including a process receiving a credit card transaction from a card issuer and automatically reconciling the transaction within a financial management system of an organization against a financial system record showing an intent to purchase.

27. An integration system associable with a credit card issuing system issuing credit cards to multiple users of an organization with each of the cards having and imposing issuer limits and said integration system comprising:

a financial management system of an organization providing control and accounting for financial transactions of organization employees and providing financial system limits, and comprising a credit card system of the organization separate from the financial management system and providing, at a time of transaction processing, spending control and accounting for credit card transactions of the employees within the financial management system using the financial system limits imposed by the organization and thereby approving/denying the transaction.

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28. A system as recited in claim 1, wherein the limits comprise non-financial limits.

29. A system as recited in claim 28, wherein the non-financial limits comprise one of vendor restrictions, product restrictions, service restrictions and time period restrictions. 5

30. A financial system of an organization coupleable to a credit card system issuing credit cards to multiple users in an organization and the credit card system controlling spending by the users responsive to issuer limits set via the credit card

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system and said financial system of the organization comprising a financial management system, separate from the credit card system, providing control and accounting for financial transactions by the users and approving spending via the credit cards, at a time of the financial transactions, through the credit card system responsive to financial system limits set by the organization.

* * * * *



US006381587B1

(12) **United States Patent**
Guzelsu(10) **Patent No.:** US 6,381,587 B1
(45) **Date of Patent:** *Apr. 30, 2002(54) **METHOD AND SYSTEM FOR
STANDARDIZING AND RECONCILING
INVOICES FROM VENDORS**

5,883,954 A * 3/1999 Ronning 380/4

FOREIGN PATENT DOCUMENTS

(75) **Inventor:** H. Isll Guzelsu, Princeton, NJ (US)WO WO 97/29445 * 8/1997
WO WO 98/44442 A1 * 10/1998(73) **Assignee:** Citibank, N.A., New York, NY (US)

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(*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Primary Examiner—Eric W. Stamber*Assistant Examiner*—Susanna Meinecke-Díaz(74) *Attorney, Agent, or Firm*—Kramer Levin Naftalis & Frankel LLP(21) **Appl. No.:** 09/054,044(22) **Filed:** Apr. 2, 1998

Related U.S. Application Data

(60) Provisional application No. 60/040,909, filed on Apr. 2, 1997.

(51) **Int. Cl.⁷** G06F 17/60(52) **U.S. Cl.** 705/40; 26/34(58) **Field of Search** 705/34, 26, 27,
705/29, 1, 25, 28, 35, 37, 38, 39, 40, 42,
43, 44(56) **References Cited**

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(57) **ABSTRACT**

A system for managing requests for services from vendors including a database having contract information for vendors, entitlement information for users and requests for services. The requests are compared with the entitlement information for the requesting user and the contract information for the vendor that supplies the information to determine if the request is approved. If the request is approved, the system generates an associated billing item in the database for the request and the approved request is transmitted to the vendor. The vendor sends an invoice of charges associated with the approved requests which is compared with the associated billing items for the approved requests. Additionally, a method for managing user requests for services from vendors is provided including providing a database for storing contract information for vendors, entitlement information for users and requests for services from a vendor. The method includes generating a request for services from a vendor and transmitting the request to the database. The method compares the request for services to entitlement information for the user and contract information for the vendor, and generates an approved request and an associated billing item in the database. The method includes receiving from the vendor an invoice of charges associated with the approved request and comparing the invoice with the associated billing item for the approved request.

9 Claims, 8 Drawing Sheets

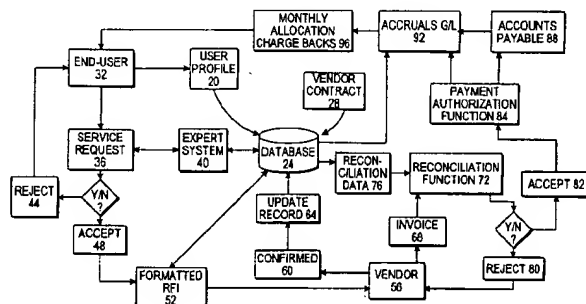
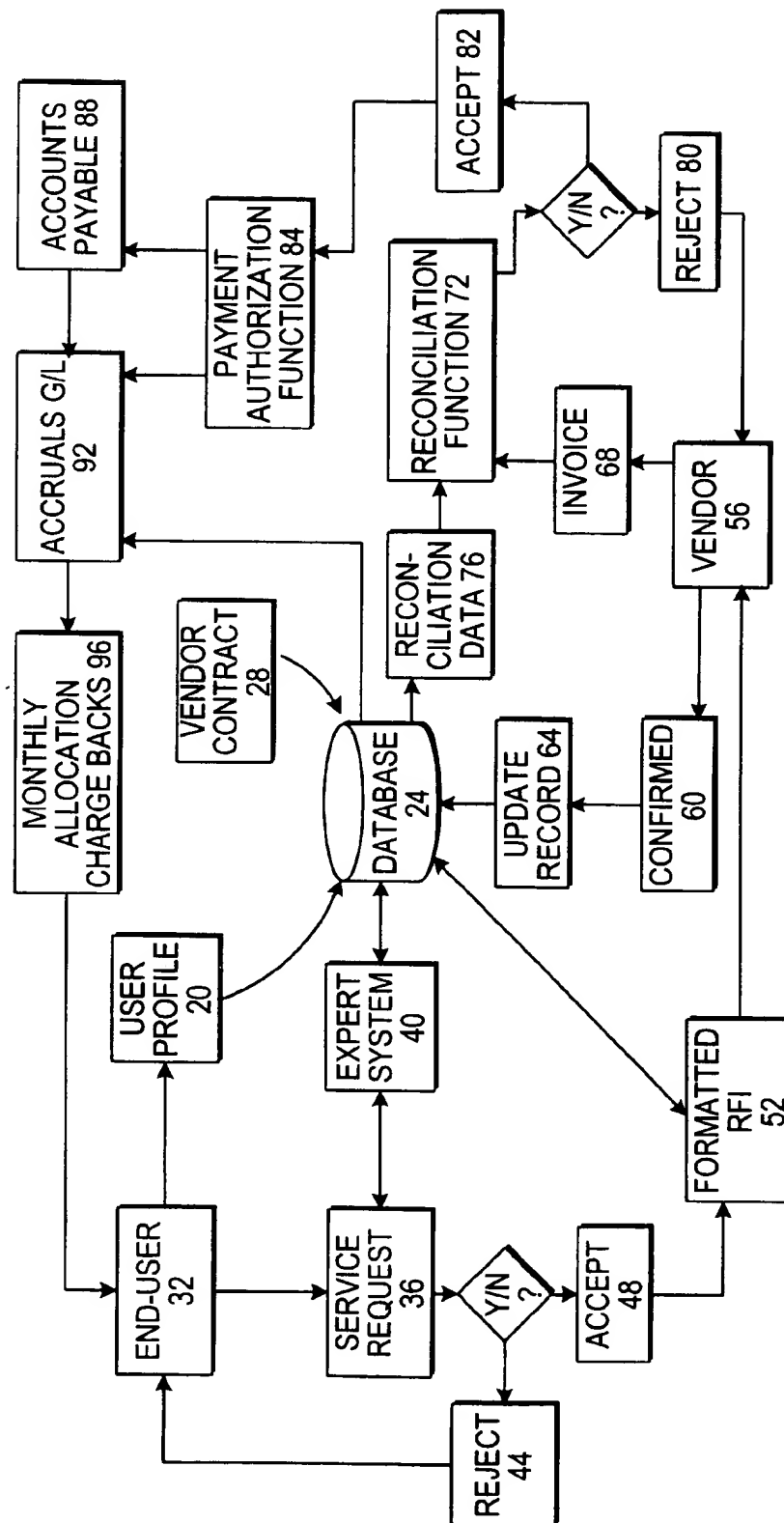


FIG. 1



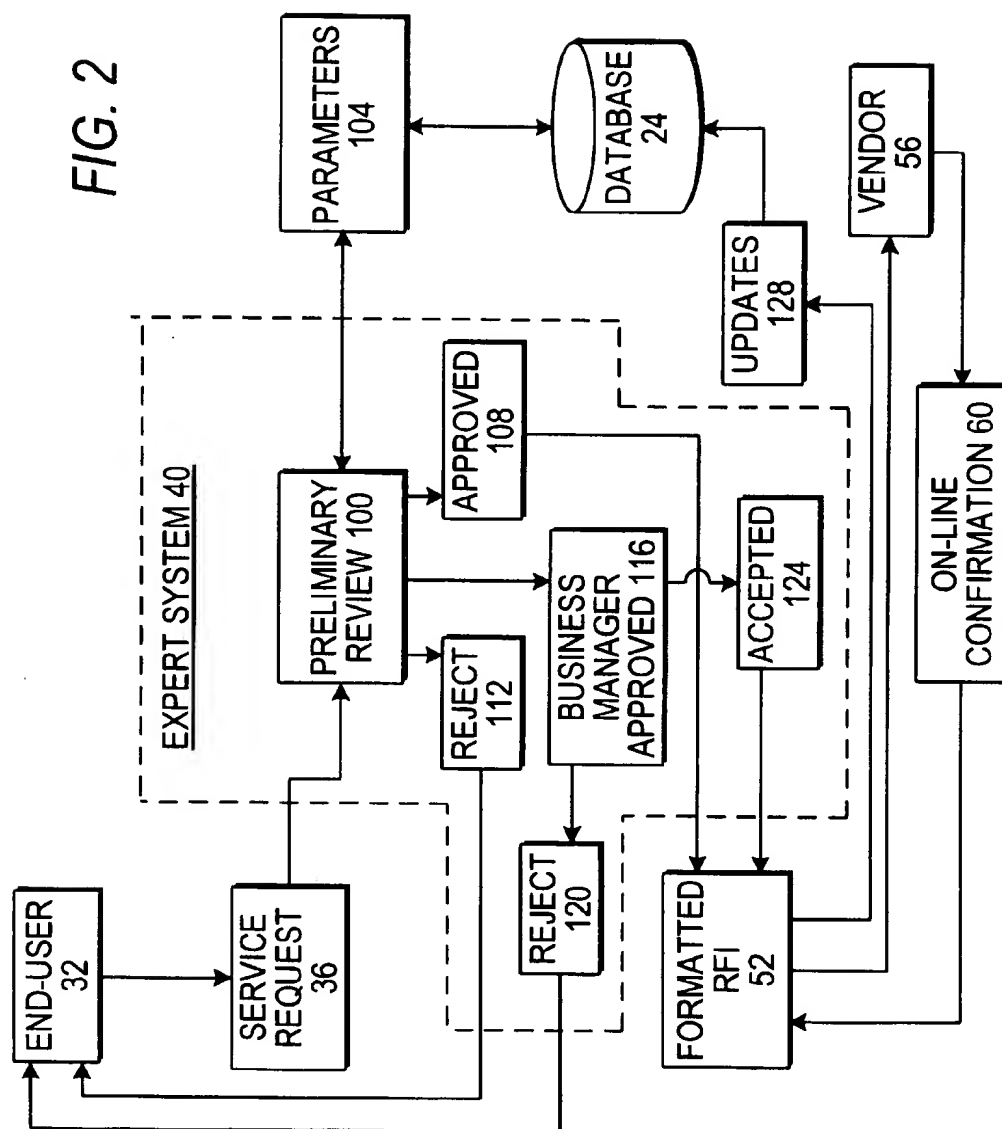


FIG. 3

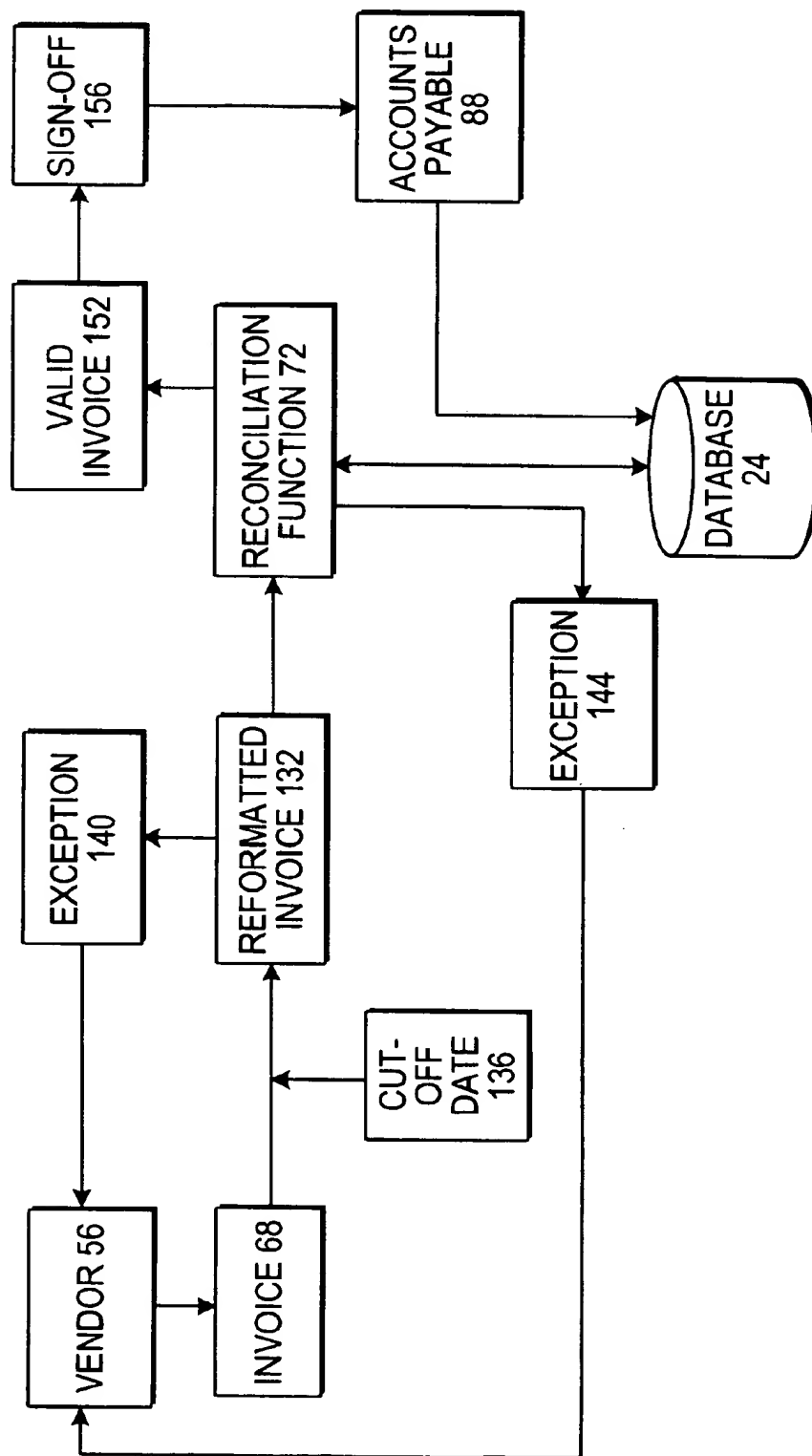
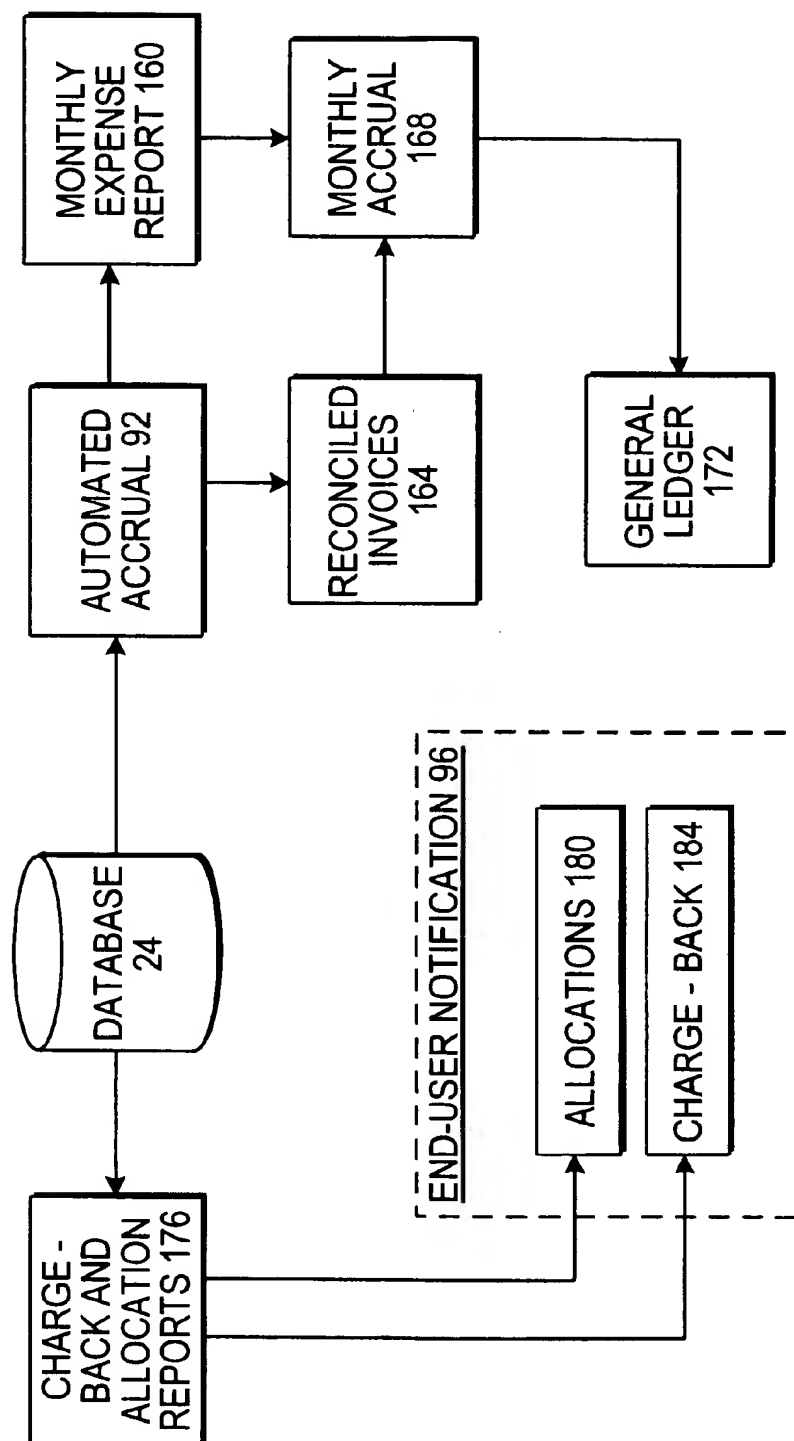


FIG. 4



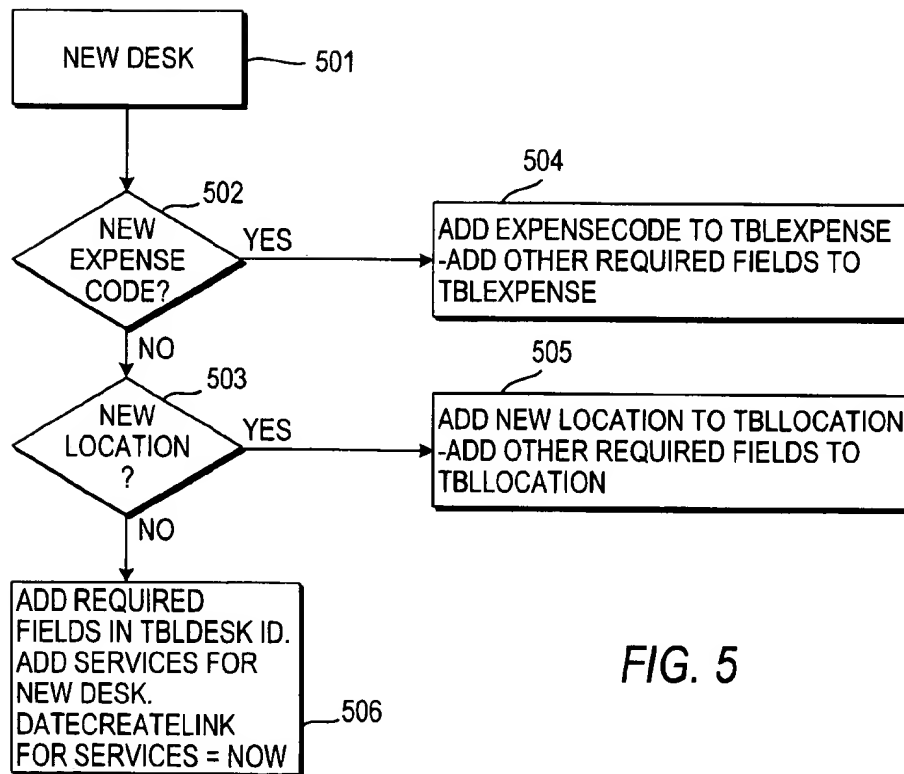
ADDING A NEW DESK

FIG. 5

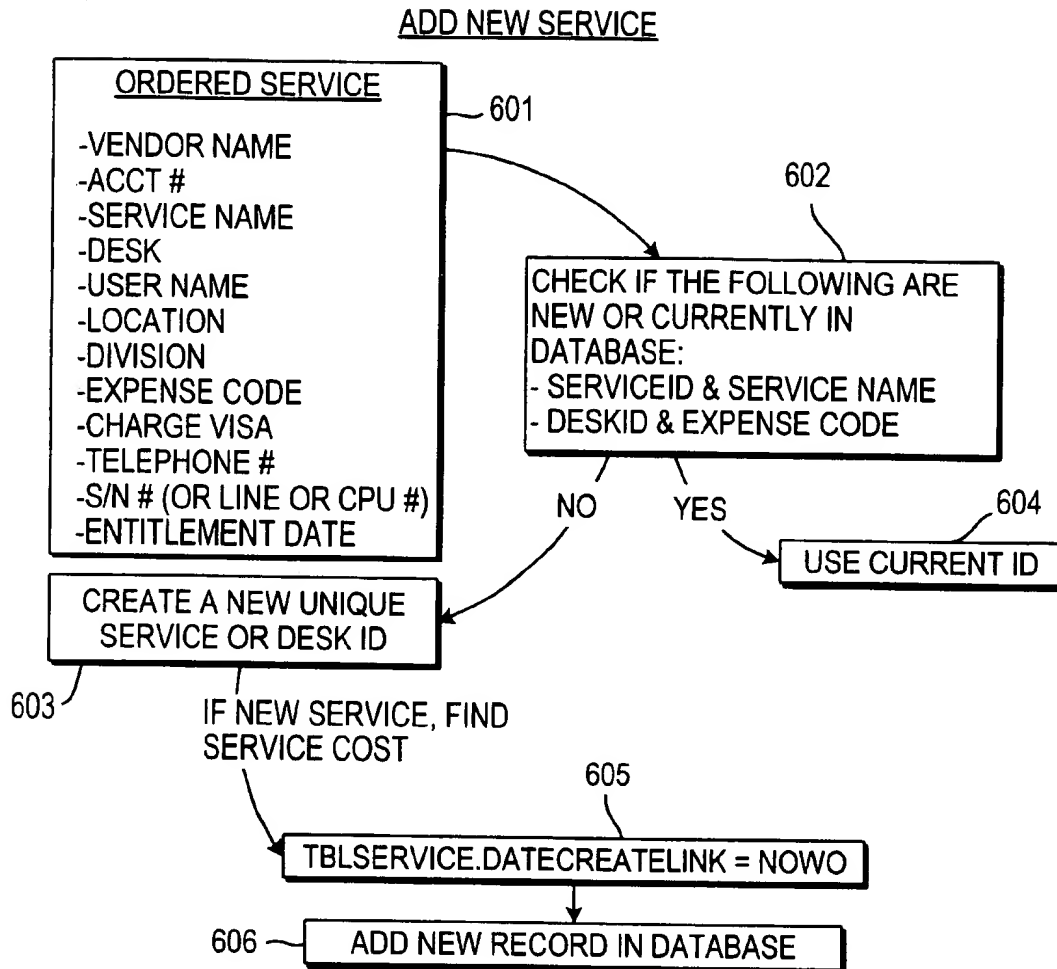


FIG. 6

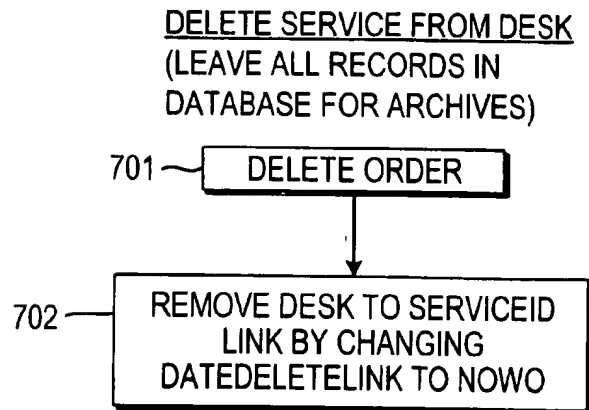


FIG. 7

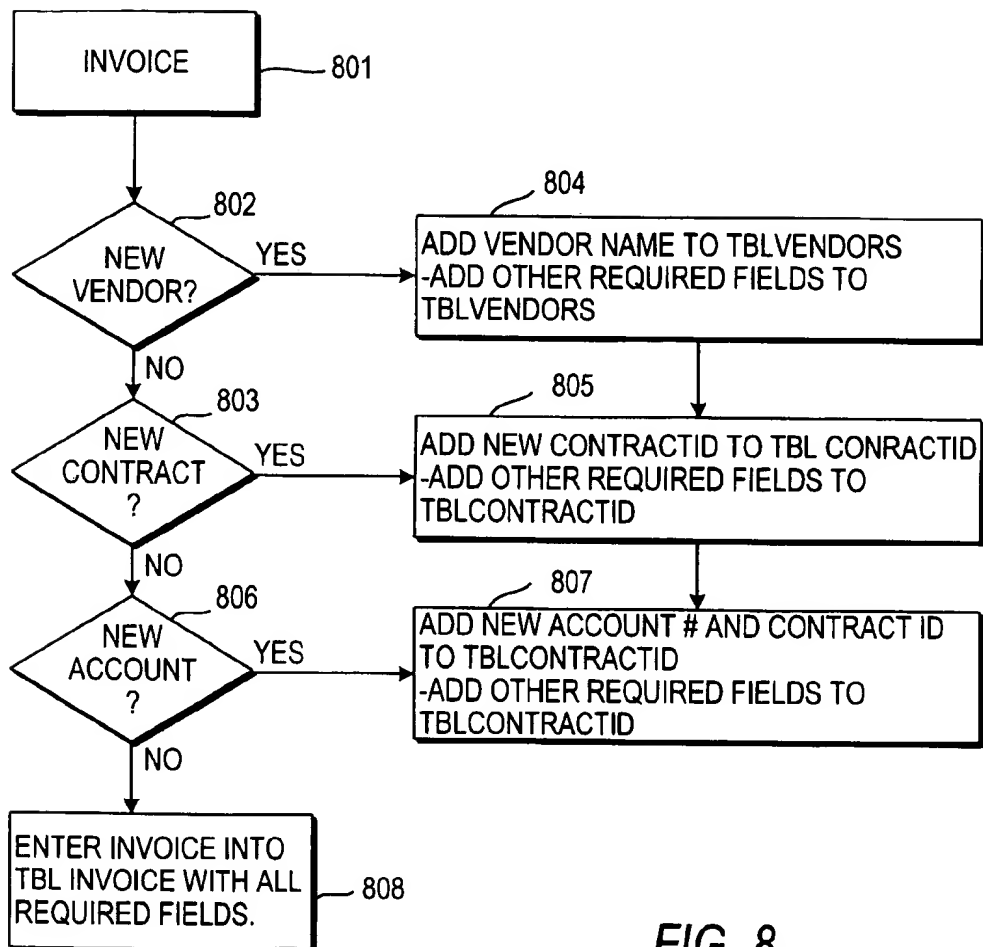
ENTERING AN INVOICE

FIG. 8

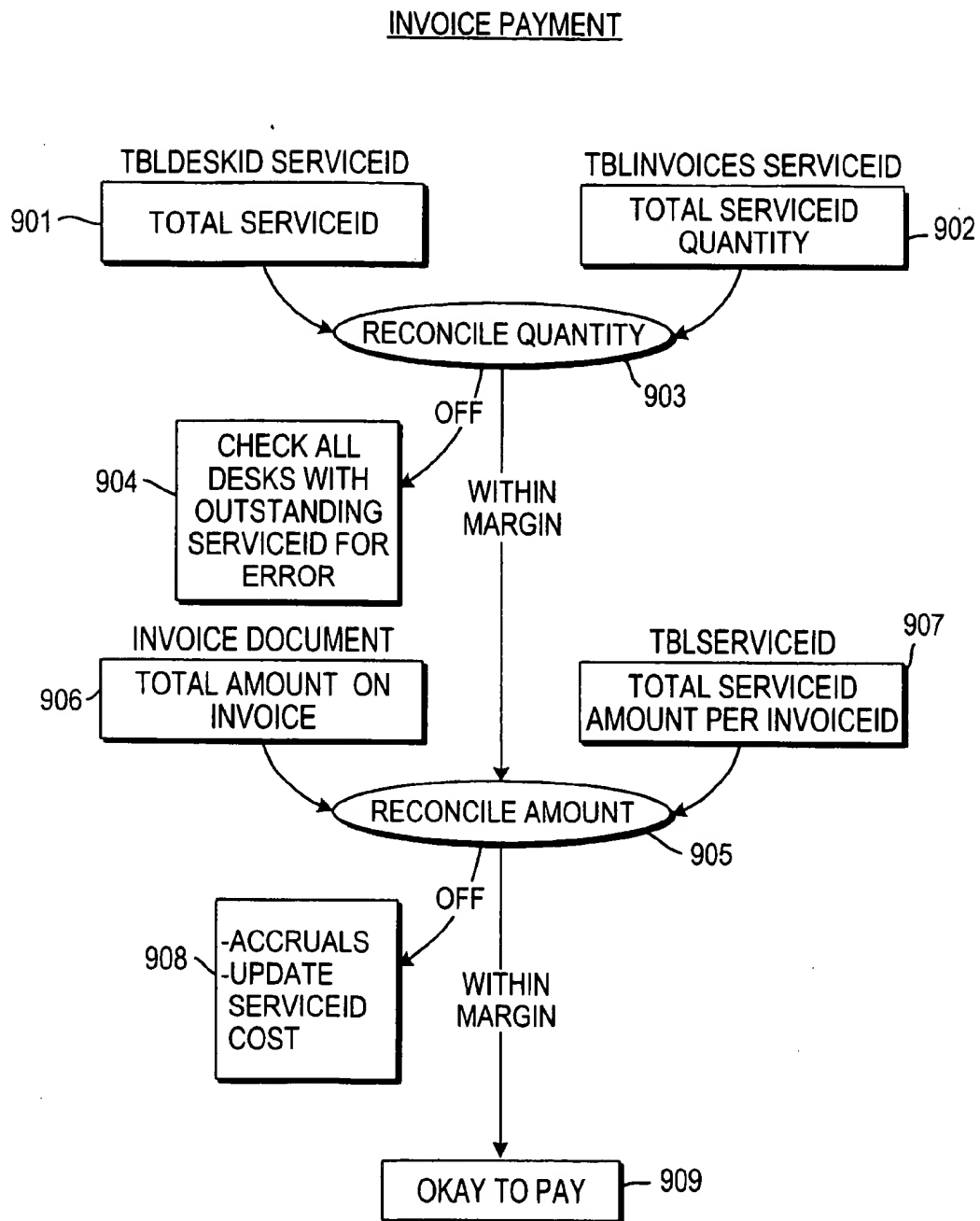


FIG. 9

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METHOD AND SYSTEM FOR STANDARDIZING AND RECONCILING INVOICES FROM VENDORS

CROSS REFERENCE TO RELATED APPLICATIONS

The present application claims the benefit of U.S. Provisional Application Ser. No. 60/040,909, filed Apr. 2, 1997 by the inventor herein.

BACKGROUND OF THE INVENTION

The present invention relates to a system and method for tracking products and services usage; and more particularly to a system and method of storing information about vendor contracts, user entitlements to the vendor products and services and requests for a product or services, as well as tracking changes in a database. The system and method allows for comparing costs charged for the requests and actual usage against vendor invoices. The system and method can handle different vendor billing methods such as flat fees, a fee per request, monthly tiered fees and various methods of applying a discount. The system and method can also track changes in user entitlements to different vendor products and services.

A preferred embodiment shows the invention being applied to the financial services industry. Financial institutions such as major banks, brokerage houses, insurance companies and the like rely on information provided by specialized financial and market data service providers. Many financial institutions may subscribe to well over 100 different national and international news and price feed information services. A typical large bank may spend an average of \$12 M annually on such services.

Within the large financial institutions, individual users, such as analysts, traders and the like will be entitled to have access to particular market data products and services, generally determined by their department or division, as is appropriate for that user. Typically, a centralized management department, typically a help desk function, within the company will assign the access rights for a particular user to a particular product or service. A user's unique set of available market data services, or entitlements needs to be managed and tracked. These entitlements, for example, can change or remain with a user if that user changes departments, or moves its physical desk.

Typically, physical moves within a company or between departments are frequent, especially at banks or other financial institutions and there is a higher-than-average turnover ratio in the financial services industry. For example, in many banks, two-year training programs for analysts start every summer and service entitlements must frequently be added or deleted for the new users to keep up with current staffing.

Management of the resources involved in accessing on-line information from vendors can raise additional complications. Certain services may require specialized hardware or licensed software to be used in accessing the information. Additionally, certain dedicated modems or phone lines may have to be provided. When a physical move of a user is planned, decisions on whether to move the hardware and other infrastructure needs to be made. If a new user occupying the seat will require the same resources as were there, then only the changes in the user name are needed. Often, however, physical equipment or software will have to be moved.

The many market data and information services vendors typically invoice for their services on a monthly basis and

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charge rates that are related to the number of users within the financial service client. Often the rate structures can be a flat monthly fee for a user. Alternatively, a flat fee for the company may be charged (in which case the present system is useful for providing an automated method of posting charge-backs to the department or user), or a fee per request or for line usage time may be used. Finally, tiered pricing schedules and volume or other discounts need to be tracked.

In many of the large financial institutions, a typical vendor's printed invoice may be an inch thick and contain thousands of line items. Since services and entitlements may be charged based on a monthly fee, for example, often when additions or deletions of users are made to an account, such changes appear on the following month invoice as a series of debits and credits. For example, if a bank deletes an entitlement in the middle of March for one user, the monthly invoice for that service will typically include a charge for one month's usage by the user. The remaining days in March not actually used are then credited on the April invoice.

Because of the extensive amount of data required in tracking individual user entitlements and reviewing the hundreds of monthly invoices, typically a financial service company can only conduct a summary review of the invoices. In general, if an invoice remained fairly constant on a month-to-month basis, it is generally paid without any further detailed reconciliation. For an invoice that is more than marginally different from the month-to-month average, a firm can spend up to three to four weeks per month reconciling and charging back these invoices.

In addition to invoice reconciliation and billing, there is a need within the financial institutions for managing the related functions of procurement and contract management for the market data services; hardware and software inventory control, and help desk support; managing moves and changes among users and among user entitlements; and managing internal departmental charge backs where the fees for the market data services are apportioned to the appropriate department or user. In the current state of affairs for typical financial institutions, disparate manual and automated systems are used for one or another of these various functions and often cause duplicate processing and data entry throughout the various responsible areas within the financial institution.

What is desired is a system and method that can track vendors and contract related data, including costs for every type of service provided by the vendors. The system should maintain complete information on market data service contracts, with on-line update of service terms and usage. The system preferably tracks vendors, contracts, products, services, various vendor pricing methodologies, delivery and third-party billing information.

It is also desirable for the system to process and reconcile invoices from the vendors. For example, the system should reconcile vendor invoices against individual usage data. It would be most desirable for the system to receive electronic invoices for direct import into the system from the market information service vendors. The system then automatically calculates costs based on an inventory of actual requests for information, and calculates unit costs for services based on the various vendor pricing methodologies. The system should automate the reconciliation of charges against usage data and provide appropriate charge back reports.

It is desired to provide an internal charge back processing function which can allocate monthly market data costs back to the financial service institution user or department. Unit costs for all services are calculated at various levels and

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pricing methodologies and include an appropriate allocation for direct usage charges, shared account level charges and company site license type allocations. In the past, this function has been a manually intensive, imprecise and incomplete process.

The system desirably contains a real-time inventory of locations, hardware, software and entitlements for users or employees. Historical usage information should also be maintained by the system to verify new charges and credits with the vendors.

The system should manage help desk functions, such as moving a user or changing a user's entitlements. Preferably, the system can create "tickets" for repairs and work orders covering equipment, market data services, and general hardware or software help. The system should desirably also track calls to a help desk and record completion of help desk requests.

The system should also have the capability of planning and implementing both small and large-scale moves of multiple employees or users, entitlements and equipment from one seat to another. Employees, entitlement and equipment should be able to be moved independently from one another. Once a particular move is planned, the system generates and tracks the individual "tickets" or work orders which are needed to perform the move. Work orders are then routed automatically to the appropriate department, vendors and contractors who will be performing the individual tasks.

The system and method of the present invention satisfies all of the above needs and advantageously provides a complete integrated solution to meet the disparate requirements of the various departments that manage, use and implement market information and data services. It eliminates duplicate efforts and the intensive manual processing of invoices, move processing and work order tracking. The system and method is able to monitor and prevent duplicate services from being received at certain seats where multiple vendors are providing the same data to the user. The system and method is able to reconcile and uncover discrepancies between line item totals and invoice amounts relative to the entitlements of individual users. The system and method of the present invention can enable a financial institution to perform a complete line-by-line audit of every vendor invoice which will allow reconciliation of every line item and every mid-month credit and charge.

SUMMARY OF THE INVENTION

The present invention relates generally to a system and method for reconciling vendor invoices for products and services with actual usage by individual users within a company. More particularly, the present invention is a computerized system and method for receiving invoices from vendors and tracking the amounts in the invoices against a database containing information about the vendor service contracts, user entitlements to that service, and actual usage of the service. The system also includes functions for automated tracking and inputting or changing user information, vendor service contract changes, and help desk requests related to the hardware or software used to acquire the data from the vendor products and services.

The system of the invention processes accounts payable in the back office of, for example, the trading floor of a bank or other financial institution. In a particular embodiment of the invention, various traders or other users order on-line market information services, magazines and other information for the purposes of carrying out their job and analyzing the market. Determinations are made whether those products

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and services are authorized to be purchased, and then they are entered into the system, processed and paid. The system receives invoices from vendors in electronic form, and facilitates reconciling and processing so that the accounts payable department can pay the invoices.

The system of the invention is a fully integrated expense control system and is capable of doing a profit and loss analysis based on the vendor products and services charged for, and the revenue generated by the users requiring those services. The system tracks inventory, reconciles invoices and is capable of educating the business people by generating various reports.

The system and method of the invention is capable of providing a return on investment analysis as well. For example, many of the services from market information providers include a one-month free trial. The system would enable the manager running the department interested in the trial to determine if adding the trial service as an entitlement to the department users would enhance the performance of those receiving that particular service, and thus the manager can evaluate whether the service should be purchased beyond the trial month. Additionally, if different vendors provide similar services, an analysis can be made of which one costs less. The system provides profit and loss accountability allowing business managers the opportunity to determine the actual value of vendor products and services.

In accordance with the invention, a system for managing product and service usage from vendors is provided. The system includes a database having contract information for vendors, entitlement information for users and requests for a product or service from a vendor made by a user. The requests for products and services from a vendor are generated by the user of the system. The requests are compared with the entitlement information for the requesting user and the contract information for the vendor that supplies the product or service to determine if the request is approved. If the request is approved, the system generates an associated billing item in the database for the request. The approved request is transmittable to the vendor. The system receives, from the vendor, an invoice of charges associated with the approved requests, and compares the invoice with the associated billing items for the approved requests.

Additionally, in accordance with the invention, a system for managing user requests for products and services from vendors is provided. The system includes a database for storing contract information for vendors, entitlement information for users and requests for products and services from a vendor. The system includes input/output means operable by a user for generating a request for products and services from a vendor and transmitting the request to the database. The request for products or services is compared to the entitlement information for the requesting user and the contract information for the vendor to determine if the request is approved. The system generates a billing item associated with approved requests and transmits the billing item to the database. The approved request is transmittable to the vendor. The system receives from the vendor an invoice of charges associated with the approved request and compares the invoice with the associated billing item for the approved request.

In accordance with the invention, a method for managing requests for products and services from vendors is provided. The method includes providing a database which stores contract information for vendors, entitlement information for users and requests for a product or service from a vendor. The method includes generating, by a user, a request for a

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product or service from a vendor, and comparing the request with the entitlement information for the user and the contract information for the vendor to determine if the request is approved. Approved requests are transmittable to the vendor. The method includes generating an associated billing item in the database for approved requests. The method includes receiving from the vendor an invoice of charges associated with approved requests, and comparing the invoice with the associated billing item for the approved request.

Additionally, in accordance with the invention, a method for managing user requests for products and services from vendors is provided. The method includes providing a database for storing contract information for vendors, entitlement information for users and requests for a product or service from a vendor. The method also includes generating, by a user, a request for a product or service from a vendor and transmitting the request to the database. The method compares the request for a product or service to entitlement information for the user and contract information for the vendor, and generates an approved request. The system generates a billing item associated with approved requests and transmits the billing item to the database. The approved request is transmittable to the vendor. The method includes receiving from the vendor an invoice of charges associated with the approved request and comparing the invoice with the associated billing item for the approved request.

An object of the invention is to provide on-line product and service request management between end users and vendors.

It is a further object to provide automation of invoice reconciliation for quantity and dollar amount of products and services used, against a database containing costs and other information for the products and services.

Still another object of the invention is to provide automation of the invoice approval processes by accounts payable.

Yet another object of the invention is to provide end user charge notification by an on-line network system.

Still another object of the invention is to provide automated accrual and financial management tools.

Still other objects and advantages of the invention will, in part, be obvious and will, in part, be apparent from the specification.

The invention, accordingly, comprises the several steps and the relation of one or more of such steps with respect to each of the others, and the system embodying features of construction, combinations of elements and arrangement of parts which are adapted to affect such steps, all as exemplified in the following detailed disclosure, and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a full understanding of the invention, reference is had to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a schematic representation of an on-line service management system in accordance with the present invention;

FIG. 2 is a schematic representation of an on-line service request management system in accordance with the present invention;

FIG. 3 is a schematic representation of an automated invoice processing and payment authorization system in accordance with the present invention;

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FIG. 4 is a schematic representation of a monthly financial cycle accrual and allocation/direct charge system in accordance with the present invention;

FIG. 5 is a flowchart showing the steps for adding a new desk in accordance with the system and method of the present invention;

FIG. 6 is a flowchart showing the steps for adding a new service in accordance with the system and method of the present invention;

FIG. 7 is a flowchart showing the steps for deleting a service from a desk in accordance with the system and method of the present invention;

FIG. 8 is a flowchart showing the steps for entering an invoice in accordance with the system and method of the present invention; and

FIG. 9 is a representation showing the steps for paying an invoice in accordance with the system and method of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The automated system and method of the invention allows, for example, a financial institution to manage a complex array of market data services effectively and efficiently. The system and method allows tracking of and maintaining of the details for the market data services and equipment contracts with the various market data service providers or vendors. The system allows a company, such as a financial institution or bank, to track and maintain vendor services for every user in the company. The system and method allows a manager to plan and execute user moves from seat to seat and the help-desk manager can move all or selected services and equipment for employees.

A database provided by the system is updated automatically when a move is completed. The system can create and track help desk work tickets for all help desk requests, including changes to market data service usage. The market data services database is updated automatically when the ticket is closed.

The system allows for review of service usage and can identify duplications, track monthly changes and costs by user, and perform various functions useful for business and planning. For example, the system of the invention can reconcile monthly vendor invoices against the market data service database of user requests.

FIG. 1 shows an on-line market data service management system in accordance with the invention. User information is generally tracked by a seat location. For a user, different entitlements to various market data service providers can be made. The entitlements may be grouped for particular departments and a user's entitlements may be based on a profile for that department. The information about a user profile 20 is entered into a database 24. Database 24 constitutes the central repository for all information for managing on-line market data service requests and associated functions.

Database 24 also includes vendor contract information 28 which may generally include the time frame or period for which the contract is valid, and the cost and quantity of services available under the contract. Database 24 also includes additional information to be described below.

Requests for on-line market data are made by an end user 32. End user 32 is identified by a seat location which should match the seat location for that user's entitlement information 20 as entered in database 24. End user 32 will make an

on-line market data service request 36, which is judged against business criteria in an expert system 40, which relies on information from database 24 as described below with reference to FIG. 2.

In accordance with the comparison by expert system 40 against business criteria, on-line service request 36 may be rejected 44 and notification to end user 32 provided. Generally, however, end user 32 will make an on-line service request 36 for a market data service to which end user 32 is entitled, as reflected in end user's entitlement information 20 in database 24. Therefore, on-line service request will typically be accepted 48 and the system will prepare a formatted request for information 52 which will include vendor information, service information, optionally an expense code, cost, and contract billing start date and period, all of which information can be retrieved from database 24 and vendor contract records 28.

It is important to recognize that requests for information 36 in the context of the on-line market data service management system in accordance with the invention, can be actual user requests for market data information and can additionally be help desk requests for adding a user, deleting a user, or adding or deleting a service for any given user, all as described further below.

The formatted request for information 52 is transmitted to vendor 56 and vendor 56 will transmit a confirmation back to the system 60, thus assuring that an accurate record of the request has been received by vendor 56 and database 24. Once the formatted request for information 52 is confirmed 60 by vendor 56, database 24 is updated 64 with information about the request. Therefore, database 24 also includes information about actual requests for market data information as well as accurate information for user 32.

Information in database 24 can be used by business managers and planners to forecast charges for market data services and charging back actual costs of those services to the departments or even individual users. In addition, the information in database 24 can be used to reconcile invoices from vendors 56. Vendors 56 prepare a invoice 68 which will include certain standardized fields such as account number and charges. Standardized invoice 68 is transmitted to the system for invoice reconciliation, payment authorization, accrual of charges, and end user charge notification, all indicated at 72. Invoice reconciliation 72 collects reconciliation data 76 from database 24. If invoice reconciliation 72 does not match information in database 24 with invoice 68, the invoice is rejected 80 and sent back to vendor 56. If invoice reconciliation matches information from database 24 with invoice 68, invoice 68 is accepted 82 and the system sends the information to a payment authorization function 84 which prepares the appropriate routing slips and sends the correct forms to accounts payable 88. Information from payment authorization 84 and from accounts payable 88 is transmitted to the accruals and general ledger function 92 which, along with receiving additional information from database 24, provides the financial cycle information for the month and prepares monthly allocations and direct charges back 96 to departments. The monthly allocation and direct charges 96 are transmitted to end user 32 and the tracking and management of on-line market data is complete.

FIG. 2 shows in greater detail the on-line service request function of the system in accordance with the invention. As described above, end user 32 makes a market data information request 36 and the market data information request 36 is compared with business criteria in an expert system generally indicated at 40. Expert system 40 includes a

preliminary review 100 which checks the parameters 104 of information about the user in database 24 to generate an approval 108, after which a formatted request for information 52 is prepared.

Preliminary review 100 may automatically reject 112 the request 36 for any number of reasons, such as end user 32 not being entitled to the requested service. In the case of a rejection 112, end user 32 is notified.

Preliminary review 100 may marginally approve or reject request 36 and provide such information to a business manager approval function 116 which can reject the request 120, notifying user 32, or accept 124 request 36 and prepare the formatted request for information 52 depending on the particular business needs for the request.

As discussed above, formatted request for information 52 is transmitted to vendor 56 for an on-line confirmation 60, and when received, updates 128 database 24.

FIG. 3 shows in greater detail the automated invoice processing and payment authorization function of the system in accordance with the invention. Vendor 56 receives request for information (not shown) and prepares a standardized invoice 68 which includes certain necessary fields such as the account number, cost, vendor, service and the dates used. The invoice is sent to the system and a reformatted invoice 132 is generated. In order to provide a snapshot of the account information, an arbitrary cut-off date 136, for example, the 15th of the month in the example is used. The standardized reformatted invoice 132 is sent to the automated reconciliation function 72.

If standardized reformatting 132 does not find the necessary information, an exception 140 is made and vendor 56 notified.

Similarly, automated reconciliation 72 may reject an invoice and generate an exception 144 and vendor 56 so notified. Automated reconciliation 72 uses information from database 24 to reconcile the invoices. Automated reconciliation 72 also updates database 24 and prepares a valid invoice 152 for automated sign-off 156. Automated sign-off 156 prepares an internal bill, checks the signatures and compliance and forwards the information to accounts payable 88 which also updates database 24.

FIG. 4 shows the monthly financial cycle accruals and allocation of the direct charge function of the invention. An automated accrual function 92 can get information from database 24 in order to prepare a monthly expense report 160. Since database 24 also contains current information on reconciled invoices, the amount of reconciled invoices 164 can be subtracted from the monthly expenses to determine the accruals for the month 168. Accruals 168 can be reported by vendor, or account number or expense code as necessary. Information on the monthly accrual 168 can then be sent to the general ledger function 172 and expenses forecasted. Database 24 can also provide charge back and allocation information to the end users. Information from database 24 can be extracted and reported 176 and these reports sent as a notification to the end user 96 which may include allocations 180 or direct charges 184 for that user.

As described above, a user of the system in accordance with the invention is assigned a seat number which generally corresponds to a physical desk. When a new user is added to the system, a request to the help desk is made for adding a new desk. The help desk adds a new desk in accordance with the method shown in FIG. 5. The new desk 501 is generated. It is determined whether a new expense code 502 is needed for this desk. If not, it is determined whether this new desk is physically at a new location 503. If, on the other hand, a

new expense code **502** is generated, an expense code is added **504** to the master tables and the new location is added **505**. Similarly, if it is not a new expense code **502** but it is a new location **503**, the new location is added **505** to master tables. Then, all required fields are updated **506** to the master tables. Also, if new location **503** is not required, then required fields are updated **506** in the master tables for the desk.

New services can be added to an existing seat or desk. The method for adding a new service is shown in FIG. 6. For any new market data service vendor, for which an entitlement is to be given to a new desk, a ticket **601** is filled out for the help desk which will include information such as vendor name and account number, service name, user name desk at location, and the like. The service i.d. and desk i.d. codes are checked to see if they currently exist in the data base **602** and if not, new unique service or desk i.d.'s are created **603**. If the service codes exist in the master data files, the current i.d.s are used **604**. In either case the master data tables are updated with the new information **605** and the new record is added to the database **606**.

Likewise, services may be deleted from a desk where a user's entitlement no longer includes that service. The method is shown in FIG. 7. A delete order **701** is filled out and transmitted to the help desk and the desk is removed by modifying the master table **702** by the help desk.

Invoices from vendors are entered into the system by the method shown in FIG. 8. A new invoice **801** is received and it is determined whether it is from a new vendor **802**. If it is not, it is determined whether it is a new contract **803**. On the other hand, if it is a new vendor **802**, then the new vendor name is added **804** to the vendor data in the master tables and new contract i.d. information is also added **805**. Likewise, if it is a new contract **803**, new contract information is added **805**.

However, if it is not a new vendor **802** and it is not from a new contract **803**, it is determined whether a new account is being invoiced **806**. If it is a new account **806**, the new account information is added **807** to the master table and the invoice is entered **808** into the database. Likewise, if it is not a new account, the invoice can also be added **808** directly to the database.

Once the invoice is in the system, the invoice payment process can occur as shown in FIG. 9. The system looks up the total service count **901** and quantity **902** from the stored data information in the database. The quantity is reconciled **903** by comparing the total service count **901** with total service quantity **902**. If the reconciliation **903** is off, all desks are checked for outstanding service i.d. errors **904**. If, on the other hand, the reconciliation is within tolerances, the amount is reconciled **905** by comparing the total amount on the invoice **906** and the amount **907** from the database. Again, if the amount reconciled is off, data is sent to the accrual data base and the service i.d. is updated **908** or, if the reconciled amount **905** is correct, the system indicates that it is okay to pay **909**.

The system and method is preferably implemented by software on a computer and preferably takes the form of a graphic user interface application. Managers and users may have different functions available to them, depending on the configuration of the system. A "help desk" function is available to access the help desk ticket entry and move functions described above, and allows a manager to assign market data services to specific users. A market data function allows users or managers to access and request market data services.

The system of the invention in the preferred embodiment helps a financial institution manage market data services. The help desk has access to update the market data service master tables, and can define vendor products and services, track and maintain service usage, review service usage, import and reconcile vendor invoices, process data and run reports.

Different vendor products and services can have different charge back types, which determine how the cost of a service will be billed to users. Service types generally come in two predefined types, for example, and additional service types can be defined as needed. The pre-defined service types are individual services, that is the seat to which the service is assigned pays the full cost of use of that service. The other type of service is a shared account in which the total cost for all units of the service delivered to an account is shared among all seats receiving any service from that account. For example, if five units of the service are delivered to an account, and ten seats receive a service through that account, the cost of the five units is divided evenly among the ten seats.

A billing type is used to indicate how a service is billed by the vendor. Typical billing types include third-party billing in which a service is billed by the vendor originating the service (the third-party vendor) rather than the delivering vendor. Delivering vendor billing is where services are billed by the vendor delivering the service regardless of where the service originates.

Market information products and services are purchased from vendors. The vendor's product or service is listed in the vendor master tables. Vendor master tables include information for the vendor, vendor contacts, vendor products and vendor services. Basic name and address information for the market data information vendor can appear on a vendor data screen. Vendor products are defined on a products screen. Some vendors offer clearly defined products, such as Tele-rate's "digital fee." Other vendors may offer only a single suite of services with no product name, or only individual services. Market data services received from the vendor are separately defined on a vendor services screen. Service codes for associated charges, such as site charges, that are billed monthly may be indicated in the vendor services screen.

Additionally a vendor service may include an indication if the service pricing is tiered. Tiered pricing is used to handle a number of pricing situations as described below. Additionally, a discount rate offer by the vendor, whether a discount applies, may be indicated. Finally, if the services are charged through a third-party vendor rather than the delivering vendor, another indication can be made.

Tiered pricing is used for certain pricing situations. Classic tiered pricing, such as when 1-4 units cost \$100 per unit and 5-9 units cost \$80 per unit and so on; first unit pricing, as when the first unit cost \$50 and all additional units cost \$10; tiered percentage discounts as when 1-4 units are not discounted and additional units receive a 10% discount and so on (mathematically equivalent to classic tiered pricing); and site fees. Preferably site fees can be handled in a different manner, but it is possible to include the site fee as part of the first unit cost.

Service usage is tracked in a service usage and invoice screen. On this screen a user can input account, contact and invoice data and can review data from vendors. When the user accesses the service usage and invoices screen, typically they will select a vendor name from a vendor name drop down box. Vendors can be added in the vendor data

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screen by the help desk. The user can enter or edit the number of units which are purchased in a month under the site license contract for the service. To add or edit other information, the user can go to other screens.

In most cases, one account number is associated with one account. If the contract covers five units of a service, the cost of those units is allocated among all seats that receive one or more individual services through that account.

The invoices function permits a manager to enter vendor invoices for reconciliation against market data information service provider invoices. The manager can view or edit invoices that have been imported electronically. Different vendors provide a different set of data fields in their invoices. However, it is preferable that at least certain data fields are in common. Typically the invoice records will include fields for vendor service, vendor service code, a start and end date of billing for this service, quantity of service billed, unit cost, charged amount, discount percent, discount amount, tax rate percent, tax amount and final cost. Once the invoices are in the system, the manager can access the reconcile function to go directly to the reconcile invoices screen. The currently selected invoice will be entered on that screen.

The system allows managers and the help desk to process the data and generate report files or compute cost per seat amounts and the allocation of vendor service cost to individual seats. For services defined as individual, non-licensed, and non-tiered priced, the process is simple. The unit cost of this service, after discounts and taxes, is charged to the seats receiving this service. For other services, the cost per seat depends on the number of seats receiving this service. This is true for licensed tiered price and shared account services. Computing these costs for the entire site has typically been a time consuming process. For that reason most marketing data service management system reports do not recompute cost per seat when they are run. Instead, they rely on figures generated by the reporting and history functions.

The help desk portion of the market data service management system allows a user to effect moves of a user or equivalent and services from one seat to another, or to add or delete services, equipment and network I.D. from a particular seat.

Accordingly, the present invention provides a method and system for tracking user requests for services and invoices from vendors in a comprehensive and efficient manner. The system and method are adaptable and useable with many different programs and activities.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in carrying out the above method and in the constructions set forth without departing from the scope of the invention. It is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted in an illustrative sense and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of this scope of the invention which, as a matter of language, might be said to fall there between.

I claim:

1. A computer implemented system for managing a plurality of user requests for services provided by vendors, comprising:

a database storing contract information for vendors, entitlement information for users and a plurality of

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billing items associated with user requests for services provided by a vendor;

means for generating a user request for services provided by a vendor, and for comparing said user request with said entitlement information for said user and said contract information for said vendor to determine if said user request is an approved request;

means for including a billing item associated with said approved request in said database, and means for transmitting said approved request to said vendor;

means for receiving from said vendor an invoice of charges for services associated with a plurality of approved requests including said approved request, and for comparing said invoice with said plurality of billing items including said billing item; and

means for allocating in accordance with said billing item a portion of said invoice to said user generating said approved request; whereby users receiving services from said vendor are charged an appropriate portion of said invoice in accordance with those services said users received from said vendor.

2. The computer implemented system of claim 1 wherein said invoice of charges includes a monthly fee per user.

3. A computer implemented system for managing a plurality of user requests for services provided by vendors, comprising:

a database for storing contract information for vendors, entitlement information for users and a plurality of billing items associated with user requests for services provided by a vendor;

input/output means operable by a user for generating a user request for services provided by a vendor;

means for comparing said user request for services to entitlement information for said user and contract information for said vendor, and generating an approved request in response thereto;

means for generating a billing item associated with said approved request and transmitting said billing item to said database;

means for transmitting said approved request to said vendor;

means for receiving from said vendor an invoice of charges for services associated with a plurality of approved requests including said approved request and comparing said invoice with said plurality of billing items including said billing item; and

means for allocating in accordance with said billing item a portion of said invoice to said user generating said approved request; whereby users receiving services from said vendor are charged an appropriate portion of said invoice in accordance with those services said users received from said vendor.

4. The computer implemented system of claim 3 wherein said invoice of charges includes a monthly fee per user.

5. A computer implemented method for managing a plurality of user requests for services provided by vendors, comprising:

providing a database storing contract information for vendors, entitlement information for users and a plurality of billing items associated with user requests for services provided by a vendor;

generating a user request for services provided by a vendor, and comparing said user request with said entitlement information for said user and said contract information for said vendor to determine if said user request is an approved request;

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transmitting said approved request to said vendor;
 generating a billing item in said database for said
 approved request;
 receiving from said vendor an invoice of charges for
 services associated with a plurality of approved
 requests including said approved request, and for compar-
 ing said invoice with said plurality of billing items
 including said billing item; and
 allocating in accordance with said billing item, a portion
 of said invoice to said user generating said approved
 request; whereby users receiving services from said
 vendor are charged an appropriate portion of said
 invoice in accordance with services said users received
 from said vendor.

6. The computer implemented method of claim 5 wherein
 said invoice of charges includes a monthly fee per user.

7. A computer implemented method for managing a
 plurality of user requests for services provided by vendors,
 comprising:

providing a database for storing contract information for
 vendors, entitlement information for users and a plu-
 rality of billing items associated with user requests for
 services provided by a vendor;

generating a user request for services provided by a
 vendor;

comparing said user request for services to entitlement
 information for said user and contract information for
 said vendor, and generating an approved request in
 response thereto;

generating a billing item associated with said approved
 request and transmitting said billing item to said data-
 base;

transmitting said approved request to said vendor;

receiving from said vendor an invoice of charges for
 services associated with a plurality of approved
 requests including said approved request, and compar-
 ing said invoice with said plurality of billing items
 including said billing item; and

allocating in accordance with said billing item, a portion
 of said invoice to said user generating said approved
 request; whereby users receiving services from said

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vendor are charged an appropriate portion of said
 invoice in accordance with services said users received
 from said vendor.

8. The computer implemented method of claim 7 wherein
 said invoice of charges includes a monthly fee per user.

9. A computer implemented method for managing a
 plurality of requests from users in an organization for
 services provided by vendors, comprising:

providing a database storing entitlement information for
 users in an organization based on at least one of the
 users' position and assigned physical location in said
 organization, contract information for vendors, and a
 plurality of billing items associated with user requests
 for services provided by a vendor;

generating a request from a user for services provided by
 a vendor, said user being identified by at least one of
 said user's position and assigned physical location in
 said organization;

comparing said user request with said entitlement infor-
 mation for said user and said contract information for
 said vendor to determine if said user request is an
 approved request;

transmitting said approved request to said vendor;

generating a billing item in said database for said
 approved request;

receiving from said vendor an invoice of charges to said
 organization for services associated with a plurality of
 approved requests including said approved request;

comparing said invoice with said plurality of billing items
 including said billing item to determine if said invoice
 is accurate;

authorizing payment for said accurate invoice;

allocating in accordance with said billing item, a portion
 of said invoice to said user generating said approved
 request based on at least one of said user's position and
 assigned physical location in said organization;
 whereby users receiving services from said vendor are
 charged an appropriate portion of said invoice in accor-
 dance with services said users received from said
 vendor.

* * * * *



US 20020073050A1

(19) **United States**(12) **Patent Application Publication****Gusler et al.**(10) **Pub. No.: US 2002/0073050 A1**(43) **Pub. Date:****Jun. 13, 2002**(54) **NOTIFICATION PROCESSING SYSTEM****Publication Classification**

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(51) **Int. Cl.⁷** **G06F 13/00**(52) **U.S. Cl.** **705/77**(57) **ABSTRACT**

Account transaction reports from a bank card account for example, are assembled and sent by electronic mail or "email" to the email address of the account owner. An input screen is presented to allow the user to input the user preferences with regard to the substance of the report. The account owner is enabled to approve or disapprove each of the listed charges and return a user-approved marked-up report showing which of the listed transactions have been approved and/or disapproved by the user. The user-approved listing is returned to the account administrator and a printed acknowledgement of receipt of the user-approved listing is returned to the user by electronic mail.

Correspondence Address:

Robert V. Wilder**Attorney at Law****4235 Kingsburg Drive****Round Rock, TX 78681 (US)**(73) Assignee: **IBM Corporation**(21) Appl. No.: **09/731,649**(22) Filed: **Dec. 7, 2000**

The screenshot shows a web browser window with a menu bar (File, Edit, View, Go, Bookmarks, Options, Directory) and a toolbar (Home, Reload, Images, Open, Print, Stop). The address bar shows "Location: MYACCOUNT.com". Below the address bar are buttons for "What's New!", "What's Cool!", "Net Search", "Net Directory", and "Newsgroups". The main content area is titled "ACCOUNT REPORT USER PREFERENCES" and contains two sections: "FREQUENCY OF REPORTS" and "REPORT SPECIFICATION".

FREQUENCY OF REPORTS

- ☒ DAILY
- ☐ WEEKLY
- ☐ BI-WEEKLY
- ☐ MONTHLY

REPORT SPECIFICATION

- ☐ REPORT ALL TRANSACTIONS
- ☐ REPORT ONLY TRANSACTIONS OVER
- ☐ REPORT BY EMAIL (EMAIL ADDRESS)

At the bottom of the form is a "SEND PREFERENCES" button.

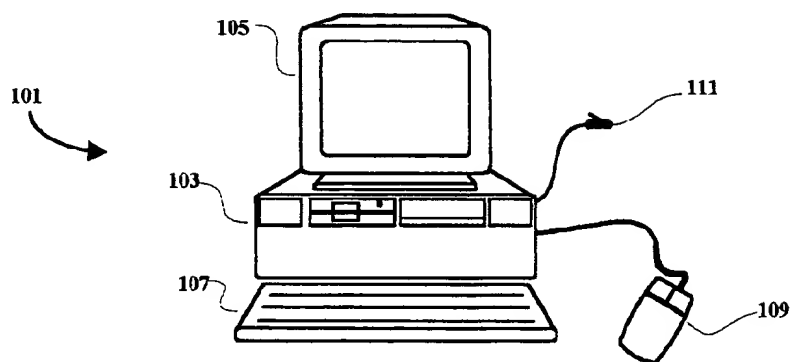


FIG. 1

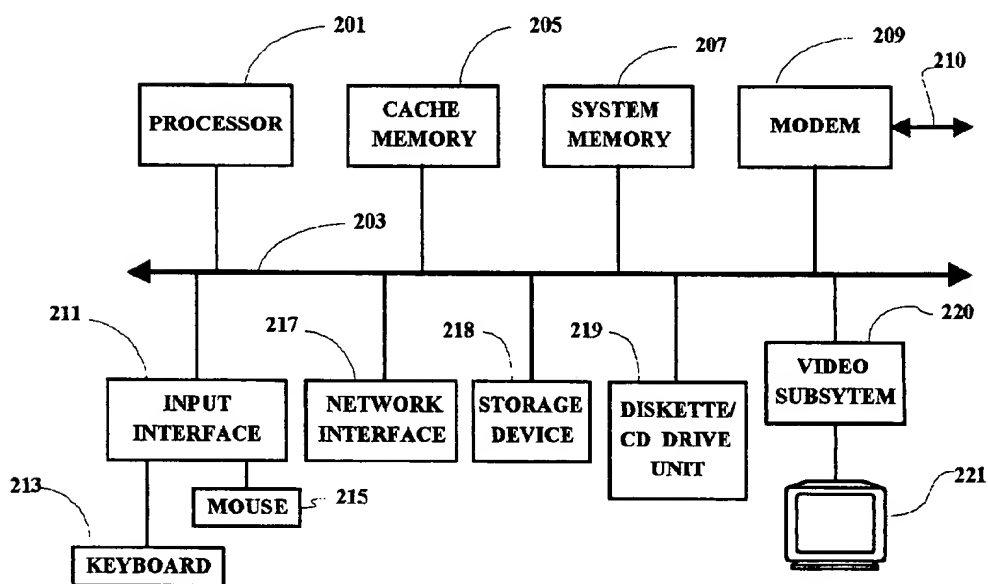


FIG. 2

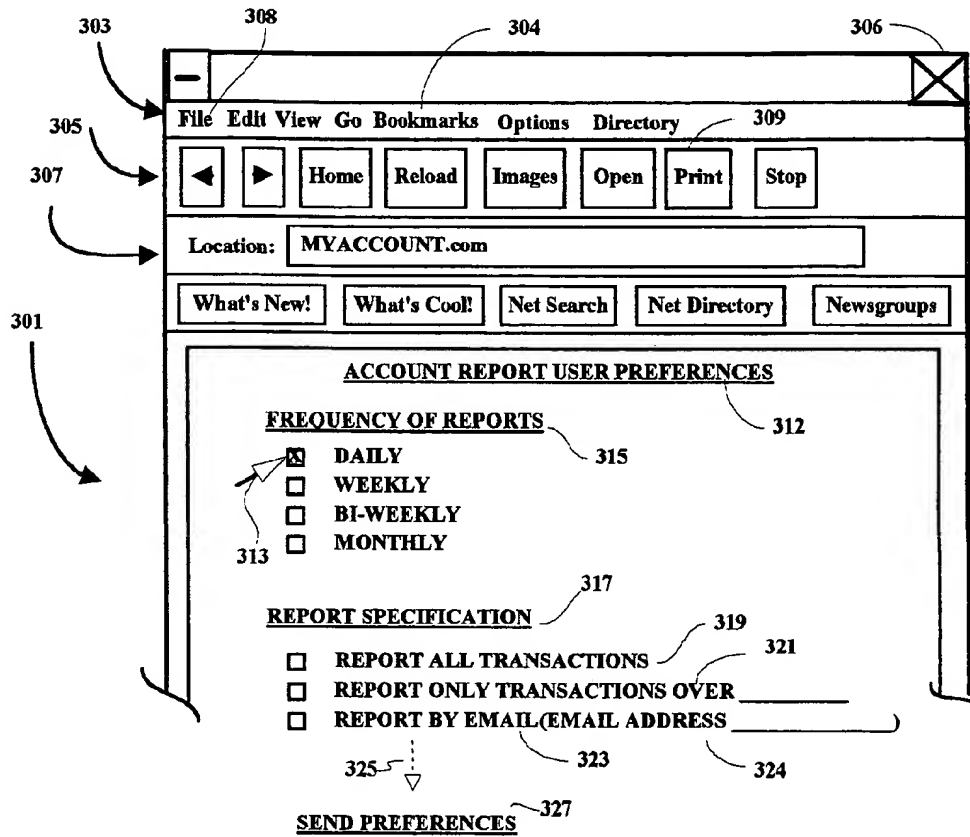


FIG. 3

CUSTOMER REPORT OF TRANSACTIONS

| <u>DATE</u> | <u>TRANSACTION</u> | <u>AMOUNT CHARGED</u> | <u>APPROVE</u> | <u>DO NOT APPROVE</u> |
|-------------|--------------------|-----------------------|-------------------------------------|-------------------------------------|
| 11/1/00 | DEPARTMENT STORE A | \$89.67 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11/1/00 | DEPARTMENT STORE B | \$334.58 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11/1/00 | GASOLINE | \$25.00 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11/1/00 | DEPARTMENT STORE B | \$158.75 | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

☐ PRINT REPORT AS RECEIVED
☐ PRINT AND RETURN DISAPPROVAL REPORT TO BANK AND EXIT
☐ EXIT REPORT WITHOUT CHANGE
☐ CARD HAS BEEN LOST OR STOLEN. PLEASE DO NOT ACCEPT FUTURE CHARGES

FIG. 4

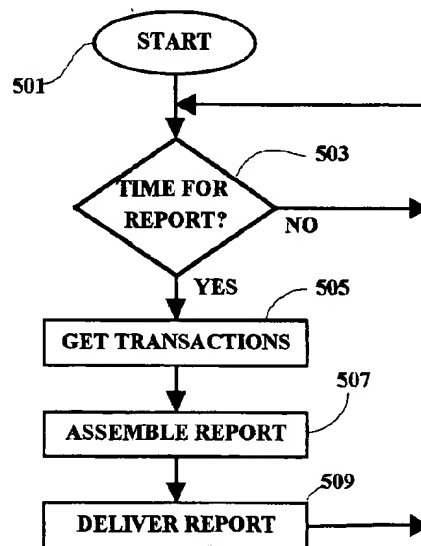


FIG. 5

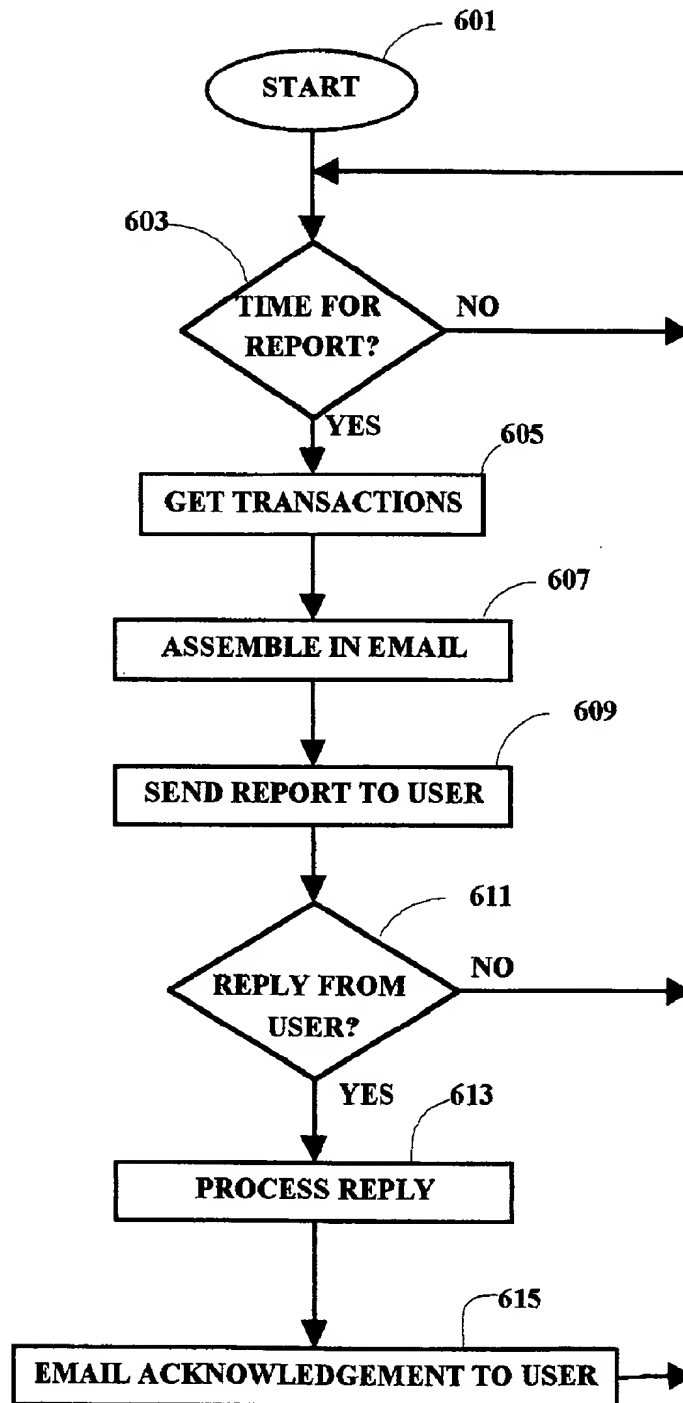


FIG. 6

NOTIFICATION PROCESSING SYSTEM

RELATED APPLICATIONS

[0001] Subject matter disclosed and not claimed herein is disclosed and claimed in related co-pending application, Attorney Docket AUS920000826US1, which is assigned to the assignee of the present application.

FIELD OF THE INVENTION

[0002] The present invention relates generally to information processing systems and more particularly to a methodology and implementation for processing account charges.

BACKGROUND OF THE INVENTION

[0003] The use of account charge cards is continuing to expand to the extent that a charge card may be used today to accomplish almost any kind of transaction. Recently, automatic teller machine (ATM) bank account cards and so-called "debit" account cards are also increasing in use and popularity. The availability and increasing use of charge cards has made it much easier and faster to purchase anything that a buyer may wish to purchase. The expansion of the World Wide Web (WWW) and the Internet have also contributed to the rapid increase in use of transaction cards and also the sheer number purchasing transactions which may occur during any given period of time for every account customer or card holder.

[0004] However, with the increasing number of transactions being made on a daily basis, it has become extremely difficult for the account holder to keep track of all of the purchases made during a billing cycle. Moreover, with more and more transactions being made, there is a corresponding increase in the number of fraudulent transactions. Generally, an account holder does not see a listing of charges from the bank account or other charge card administrator until several weeks after a transaction has occurred. Because of the relatively long time delays between the transaction and the reporting of the transaction to the customer, when a card is lost or stolen, many fraudulent charges may be made before the customer realizes that the card is missing and many fraudulent purchasing transactions occur that could have been avoided. Further, if there are fraudulent or incorrect charges that the customer wishes to dispute, the customer may call the bank to notify the bank of the incorrect charges. This process normally takes an appreciable amount of time and much follow-up to insure that the disputed charges have been recorded and, eventually, that the disputed charges are corrected. Further, the customer does not always have a record of having disputed the charges to the bank or other card administrator in a timely manner.

[0005] Thus, there is a need for an improved charge processing system which may be implemented to help alleviate the foregoing shortcomings in account processing techniques.

SUMMARY OF THE INVENTION

[0006] A method and implementing computer system are provided in which account transaction records are assembled and communicated on a periodic basis. Users are enabled to provide user preferences including the frequency with which the reports are assembled and made known to the user, as well as which particular charges to report in terms of the type

and/or amount of the charges. In an exemplary embodiment, account transaction reports from a bank card account are assembled and sent by electronic mail or "email" to the email address of the account owner. An input screen is presented to allow the user to input the user preferences with regard to the substance of the report.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] A better understanding of the present invention can be obtained when the following detailed description of a preferred embodiment is considered in conjunction with the following drawings, in which:

[0008] FIG. 1 is a diagram of a computer system in which the present invention may be implemented;

[0009] FIG. 2 is a simplified schematic diagram showing selected components and subsystems of the computer system illustrated in FIG. 1;

[0010] FIG. 3 is exemplary illustration of a webpage which may be used to enable a user to input user preferences relative to an account report;

[0011] FIG. 4 is an illustration showing an example of a transaction report presented on a user display device;

[0012] FIG. 5 is an exemplary flow chart illustrating an operational sequence in one exemplary embodiment of the methodology disclosed herein; and

[0013] FIG. 6 is a flow chart illustrating another exemplary embodiment of the methodology disclosed herein.

DETAILED DESCRIPTION

[0014] With reference to FIG. 1, the various methods discussed herein may be implemented within a computer network including a computer terminal 101, which may comprise either a workstation or a PC for example. In general, an implementing computer system may include computers configured with a plurality of processors in a multi-bus system in a network of similar systems. However, since the workstation or computer terminal 101 implementing the present invention in an exemplary embodiment, is generally known in the art and composed of electronic components and circuits which are also generally known to those skilled in the art, circuit details beyond those shown are not specified to any greater extent than that considered necessary as illustrated, for the understanding and appreciation of the underlying concepts of the present invention and in order not to obfuscate or distract from the teachings of the present invention.

[0015] In FIG. 1, the computer system includes a processor unit 103 which is typically arranged for housing a processor circuit along with other component devices and subsystems of the computer terminal 101. The computer terminal 101 also includes a monitor unit 105, a keyboard 107 and a mouse or pointing device 109, which are all interconnected with the computer terminal illustrated. Also shown is a connector 111 which is arranged for connecting a modem within the computer terminal to a communication line such as a telephone line in the present example. The present invention may also be implemented in a cellular system.

[0016] Several of the major components of the terminal 101 are illustrated in FIG. 2. A processor circuit 201 is

connected to a system bus 203 which may be any host system bus. It is noted that the processing methodology disclosed herein will apply to many different bus and/or network configurations. A cache memory device 205, and a system memory unit 207 are also connected to the bus 203. A modem 209 is arranged for connection 210 to a communication line, such as a telephone line, through a connector 111 (FIG. 1). The modem 209, in the present example, selectively enables the computer terminal 101 to establish a communication link and initiate communication with a network server. The network may comprise a direct connection through an Internet Service Provider (ISP) to a server on the World Wide Web (WWW) or the network connection may be to a local area network server for further connection to the WWW.

[0017] The system bus 203 is also connected through an input interface circuit 211 to a keyboard 213 and a mouse or pointing device 215. The bus 203 may also be coupled through a hard-wired network interface subsystem 217. A diskette or CD drive unit 219 is also shown as being coupled to the bus 203. A video subsystem 220, which may include a graphics subsystem, is connected to a display device 221. A storage device 218, which may comprise a hard drive unit, is also coupled to the bus 203. The diskette/CD drive unit provides a means by which individual programs may be loaded on to the hard drive, or accessed directly, for selective execution by the computer terminal 101. As is well known, program media containing application programs represented by magnetic or other indicia on the medium, may be read from the drive unit, and the computer system is selectively operable to read such indicia and create program signals. Such program signals are selectively effective to cause the computer system to present displays on the screen of a display device and respond to user inputs in accordance with the functional flow of the application program on the medium or as loaded into memory.

[0018] In running an Internet access program or browser program on the computer terminal 101, the access program is typically stored in the storage device 218 and either selectively or automatically, partially or totally, loaded into the system memory 207 when the system is initially powered-on, or at a later time if so desired by a user. The browser is selectively operable to access and execute a site selection program, as herein described. As a program is running, either a portion of the program or the entire program may be loaded into the system memory 207 and/or the system cache memory 205.

[0019] Depending on specific program design, the system may store any information accessed from a database in the storage unit 218, the cache memory 205, the system memory 207 or directly from a diskette or CD loaded into the medium drive unit 219. Assuming a user has started-up the system, and is actively running a browser program for example, from memory, a series of screens will be displayed to the user on the display device 221. Each screen typically has one or more selections for the user to make in navigating through the program. In general, a user will make selections from a home page display screen using the keyboard 213 or the mouse or pointer device 215. The selections made by the user will determine "where" the user "goes", i.e. to what "site" or "webpage", and also, in some cases, the communications link or the path taken to get to the WWW site selected.

[0020] FIG. 3 illustrates a browser program screen display 301. The browser screen generally includes a first row 303 of function buttons. The function buttons may be selected by a user with a pointer device using a "point-and-click" methodology which is well known. A user may select a "File" button 308 or a "Bookmarks" selection 304. Another row 305 may be displayed to help a user quickly move through documents, sites, or pages in a browser application. A user may terminate any session with a web page by actuating a terminate button 306. An address or "location" section 307 enables a user to key-in, and also displays the name of, a WWW address of a site to be, or being, visited. In general, any of the illustrated items may be selected through a "point and click" methodology associated with the mouse device 215, and a cursor or pointer 320 visible on the display screen. For example, a download of data from a remote site may be immediately terminated during the transmission by pointing to the "Stop" button and clicking on a designated mouse button. Similarly, the "Back" and "Forward" buttons may be used to return to the last screen display or go forward to the next screen display, respectively.

[0021] In the exemplary screen illustrated in FIG. 3, the user has accessed the location of a web site ("MYAC-COUNT.com") of an account administrator such as a bank account or charge card account which is owned by the user. As shown, a screen is presented to the user which enables the user to input user preferences 312 with regard to an account report. In the illustrated example, one section 315 of the user preference input screen enable a user to specify the frequency of the reports. If, using a mouse or other pointer device, the user points to and clicks a screen pointer 313 on the block next to the "DAILY" selection as shown, the user has indicated that a daily report of charges made to his account is desired. Similarly, a user may select other frequencies such as weekly, biweekly or monthly reports in the example.

[0022] In another section 317, the user may select other user preferences with regard to a periodic report of charges made against the user account with the bank issuing a charge card for example. In the example, the user may select to have all transactions reported 319, or only to have transactions 321 over a designated amount reported. The reports may be made merely by posting the information on an account web page to be accessed by the user. In a preferred embodiment, the user is enabled to designate 323 that the reports are to be sent to the user via email, and the user is able to input the particular email address 324 to which the user wishes to have the reports submitted. Other preferences 325 may also be specified by the user. When the user has provided the user's report preferences, the user is able to point and click on the hypertext "SEND PREFERENCES" 327 to send the preferences to the account server, or the user may terminate the session without input by actuating the terminate block 306. When the user preferences are sent to the account server, they are stored by the server and are referenced and used in providing periodic account transaction reports to the user by the designated means. In this way, a user is able to view transactions in a prompt and efficient manner to insure that the posted transactions are accurate.

[0023] In the exemplary report 401 illustrated in FIG. 4, a daily report has been sent to a user via the designated user's email address. The report 401 includes a series of

listings which show various transactions **405** that have posted to the user's charge account during the indicated date **403**. The report also shows the amount of the charge **407**. The display also provides means for the user to either approve **409** or disapprove **411** of each of the charges in the listing. A user may, for example, use the pointer **413** to approve all of the listed charges except one, which is not approved by the user. The report in the example is sent to the user on the day following the posting of the charges so that both the user and the bank are able to identify potentially incorrect charges at a very early point in time and significantly reduce the potential for fraudulent or otherwise invalid charges. This early detection is enabled through the use of an automated email report and response as herein described.

[**0024**] In the example shown in **FIG. 4**, by actuating the appropriate hypertext, the user is able to print the report **415** to a printer to provide a written record of the charges. Similarly, the user may print the marked-up report (i.e. the report showing the approved and disapproved blocks), and return the marked-up report **417** to the bank server, and exit the program. The user may also merely exit the report **419** without mark-up. The report may also include a quick and easy way to notify the bank of a lost or stolen credit, debit or ATM card by clicking on the designated hypertext **422**. Other user preference options may also be included for selection by the user.

[**0025**] As shown in the flow chart of **FIG. 5**, a bank server starts the methodology **501** by making a determination as to whether or not it is time **503** for a periodic report to a user or account owner. That determination is made with reference to the user input which specified the frequency of reports as discussed in connection with **FIG. 3**. The determination can be made, for example, by running the appropriate code at the beginning of or at the end of every day. Next, if it is time for a periodic transaction report to the user, the transactions are retrieved **505** and the report is assembled **507** in accordance with the input provided by the user in the Report Specification **317**. Next, the report is delivered **509** and the process returns to await the next reporting time **503**. The report may be delivered in several ways. The report may be delivered by posting the report to a web site which may be accessed by the user, or by sending an email to the user which contains the report within the email.

[**0026**] **FIG. 6** illustrates an email report delivery in more detail. As shown, the processing begins **601** with the determination that the time has come for the bank server, for example, to deliver a report **603** to a user or customer as specified in a user preference file. Next, the transactions which have occurred during the reporting period are retrieved **605** and assembled in email format **607**. The report is then emailed to the user **609** using the email address provided by the user **324**. Next, if no reply is returned to the bank from the user **611** the process returns to await the next time a report is due **603**. If, however, the user checks off the blocks as shown in **FIG. 4** and returns the marked-up report to the bank **611**, the reply is processed by the bank or other institution administering the user's account, and an email acknowledgement is returned to the user **615**. The process then returns to await the next reporting time **603**. The email acknowledgement **615** from the bank acknowledges the user's dispute of the indicated charge (**FIG. 4**) and gives the user a record of the user's timely disapproval of the charges

so marked. The bank is thereby quickly able to process the dispute and resolve the matter in a timely fashion. It is noted that security provisions may also be added and included in the processing to insure confidentiality of the communications between the bank and the user.

[**0027**] The method and apparatus of the present invention has been described in connection with a preferred embodiment as disclosed herein. The disclosed methodology may be implemented in a wide range of sequences, menus and screen designs to accomplish the desired results as herein illustrated. Although an embodiment of the present invention has been shown and described in detail herein, along with certain variants thereof, many other varied embodiments that incorporate the teachings of the invention may be easily constructed by those skilled in the art, and even included or integrated into a processor or CPU or other larger system integrated circuit or chip. The disclosed methodology may also be implemented solely or partially in program code stored on a CD, disk or diskette (portable or fixed), or other memory device, from which it may be loaded into memory and executed to achieve the beneficial results as described herein. Accordingly, the present invention is not intended to be limited to the specific form set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the invention.

What is claimed is:

1. A method for processing a charge account report for periodic display to a user, said method comprising:

selectively presenting a user preference screen on a user display device;

enabling said user to define a customized report display by selecting user preferences with regard to variable characteristics of said charge account report; and

periodically assembling charge account transaction data to include in said customized report display.

2. The method as set forth in claim 1 and further including making said customized report display available to said user.

3. The method as set forth in claim 2 wherein said customized report display is made available for access from an account server site through a network connection.

4. The method as set forth in claim 3 wherein said customized report display is made available by sending a report-related email to said user.

5. The method as set forth in claim 1 wherein one of said user preferences is a frequency with which said customized report is made available.

6. The method as set forth in claim 1 wherein one of said user preferences represents a minimum transaction amount to be included in said customized report display.

7. The method as set forth in claim 1 wherein one of said user preferences represents a selection to include all transactions which have occurred since a prior report.

8. The method as set forth in claim 1 and further including sending said customized report display to said user display device by email.

9. The method as set forth in claim 8 and further including sending said customized report display to said user display device as an attachment to said email.

10. The method as set forth in claim 8 and further including sending said customized report display to said user display device as an integral portion of said email.

11. The method as set forth in claim 8 wherein said customized report display is sent to said user automatically by an account server through a network connection.

12. The method as set forth in claim 8 wherein said customized report display is encrypted prior to sending said email, said customized report display being de-encrypted by said user after receiving said email.

13. A storage medium including machine readable coded indicia, said storage medium being selectively coupled to a reading device, said reading device being selectively coupled to processing circuitry within a computer system, said reading device being selectively operable to read said machine readable coded indicia and provide program signals representative thereof, said program signals being effective to enable a processing of a charge account report for periodic display of said report to a user, said program signals being selectively operable to accomplish the steps of:

selectively presenting a user preference screen on a user display device;

enabling said user to define a customized report display by selecting user preferences with regard to variable characteristics of said charge account report; and

periodically assembling charge account transaction data to include in said customized report display.

14. The medium as set forth in claim 13 wherein said program signals are further effective for making said customized report display available to said user.

15. The medium as set forth in claim 14 wherein said customized report display is made available for access from an account server site through a network connection.

16. The medium as set forth in claim 15 wherein said customized report display is made available by sending a report-related email to said user.

17. The medium as set forth in claim 13 wherein one of said user preferences is a frequency with which said customized report is made available.

18. The medium as set forth in claim 13 wherein one of said user preferences represents a minimum transaction amount to be included in said customized report display.

19. The medium as set forth in claim 13 wherein one of said user preferences represents a selection to include all transactions which have occurred since a prior report.

20. The medium as set forth in claim 13 wherein said program signals are further effective for:

sending said customized report display to said user display device by email.

21. The medium as set forth in claim 20 wherein said program signals are further effective for sending said customized report display to said user display device as an attachment to said email.

22. The medium as set forth in claim 20 wherein said program signals are further effective for sending said customized report display to said user display device as an integral portion of said email.

23. The medium as set forth in claim 20 wherein said customized report display is sent to said user automatically by an account server through a network connection.

24. The medium as set forth in claim 20 wherein said customized report display is encrypted prior to sending said email, said customized report display being de-encrypted by said user after receiving said email.

25. A processing system comprising:

a user terminal, said user terminal further including a system bus, a CPU device connected to said system bus, a memory device connected to said system bus, an input device connected to said system bus, said input device being arranged to enable user input to said user terminal, and a user display device connected to said system bus; and

a server terminal, said server terminal being selectively operable for being connected to said user terminal, said processing system being selectively operable for enabling a processing of a charge account report for periodic display of said report on said user display device, said processing comprising selectively presenting a user preference screen on said user display device for enabling said user to define a customized report display by selecting user preferences with regard to variable characteristics of said charge account report, said processing further including periodically assembling charge account transaction data to include in said customized report display.

* * * * *

| | L # | Hits | Search Text | DBs |
|---------------|-----|------|--|-------------------------------|
| 1 | L1 | 15 | disapprov\$4 with charg\$3 | USPAT |
| 2 | L2 | 88 | disapprov\$4 with transaction | USPAT |
| 3 | L3 | 98 | 1 or 2 | USPAT |
| 4 | L4 | 3277 | (account or charg\$3 or transaction) near5 report\$3 | USPAT |
| 5 | L5 | 3525 | (account or charg\$3 or transaction) near5 list\$3 | USPAT |
| 6 | L6 | 6312 | 4 or 5 | USPAT |
| considered 7 | L7 | 41 | 6 and 3 | USPAT |
| 8 | L8 | 280 | approv\$4 with charg\$3 | USPAT |
| 9 | L9 | 166 | approv\$4 near5 charg\$3 | USPAT |
| 10 | L10 | 75 | disapprov\$4 near5 transaction | USPAT |
| 11 | L11 | 233 | 9 or 10 | USPAT |
| 12 | L12 | 71 | 11 and 6 | USPAT |
| considered 13 | L13 | 36 | 12 not 7 | USPAT |
| 14 | L14 | 0 | 13 and disapprov\$4 | USPAT |
| 15 | L15 | 7 | disapprov\$4 near5 charg\$3 | US-PGPUB; DERWENT; IBM_TDB |
| 16 | L16 | 55 | disapprov\$4 near5 transaction | US-PGPUB; DERWENT; IBM_TDB |
| 17 | L17 | 59 | 15 or 16 | US-PGPUB; DERWENT; IBM_TDB |
| 18 | L18 | 1663 | (account or charg\$3 or transaction) near5 report\$3 | US-PGPUB; DERWENT; IBM_TDB |
| 19 | L19 | 1867 | (account or charg\$3 or transaction) near5 list\$3 | US-PGPUB; DERWENT; IBM_TDB |
| 20 | L20 | 3196 | 18 or 19 | US-PGPUB; DERWENT; IBM_TDB |
| considered 21 | L21 | 18 | 17 and 20 | US-PGPUB; DERWENT; IBM_TDB |
| 22 | L22 | 5 | disapprov\$4 with charg\$3 | EPO; JPO |
| 23 | L23 | 7 | disapprov\$4 with transaction | EPO; JPO |
| considered 24 | L24 | 12 | 22 or 23 | EPO; JPO |
| 25 | L25 | 89 | approv\$4 with charg\$3 | EPO; JPO |

| | L # | Hits | Search T xt | DBs |
|----|-----|------|--|----------|
| 26 | L26 | 257 | (account or charg\$3 or transaction) near5 list\$3 | EPO; JPO |
| 27 | L27 | 140 | approv\$4 with transaction | EPO; JPO |
| 28 | L28 | 223 | 25 or 27 | EPO; JPO |
| 29 | L29 | 480 | (account or charg\$3 or transaction) near5 report\$3 | EPO; JPO |
| 30 | L30 | 2 | 28 and 29 | EPO; JPO |
| 31 | L31 | 5 | 28 and 26 | EPO; JPO |

Considered

considered

| | L # | Hits | S arch Text | DBs |
|---|-----|-------|---|-------|
| 1 | L1 | 3 | acknowledg\$6 with disapprov\$3 | USPAT |
| 2 | L2 | 14532 | acknowledg\$6 near5 (send\$3 or recei\$5) | USPAT |
| 3 | L3 | 251 | 2 and email\$3 | USPAT |
| 4 | L4 | 56 | 3 and encrypt\$3 and decrypt\$3 | USPAT |

considered